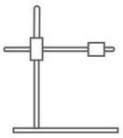
Session 1	
Learning Area	1.0 INTRODUCTION TO SCIENTIFIC INVESTIGATION
Content Standard	1.1 Science is part of daily life 1.2 Your science laboratory 1.3 Physical quantities and their units 1.4 The use of measuring instruments, accuracy, consistency, sensitivity and error.
Learning Objective	Students will be able to accomplish tasks related to science as part of daily life, the science laboratory, physical quantities and their units, the use of measuring instruments, and concepts such as accuracy, consistency, sensitivity and error.
Learning Focus	1. The importance of science in everyday life 2. Symbols of hazardous materials in the laboratory 3. Converting units of base quantity 4. The use of right measuring instruments
Teaching Aids	1. Smart Learning Notes (refer to A1) 2. UASA-format items Enhancement Exercises (refer to A2) • Fact/knowledge (content) • Science process skill 3. Assessment (refer to A3) 4. Answer scheme (Refer to A4)

A1: Smart Learning Notes

Science

1. Science is the discipline of knowledge that involves systematic observations and experiments on natural phenomena.
2. Examples of natural phenomena: lightning, thunder, rainbows, and the growth of a seedling.
3. Science can be divided into three main branches, which are physics, chemistry and biology.
4. The examples of science careers include scientist, science teachers and engineers.

Laboratory apparatus

Beaker	Test tube	Boiling tube	Measuring cylinder	Tripod stand	Evaporating dish	Retort stand
Fill chemicals in large quantities	Fill chemicals in small quantities	Heating chemicals in small quantities	Measuring the volume of liquid	Supports the apparatus during heating	Liquid evaporation	Hold or support the apparatus
						

Warning symbols

Radioactive	Irritant	Toxic / Poisonous	Explosive	Flammable	Corrosive
					
Uranium, Plutonium	Ammonia, Bromine	Mercury, Chlorine	Hydrogen gas, Butane gas	Alcohol, Petrol	Concentrated acid and alkali

Rules and safety measures in laboratories:

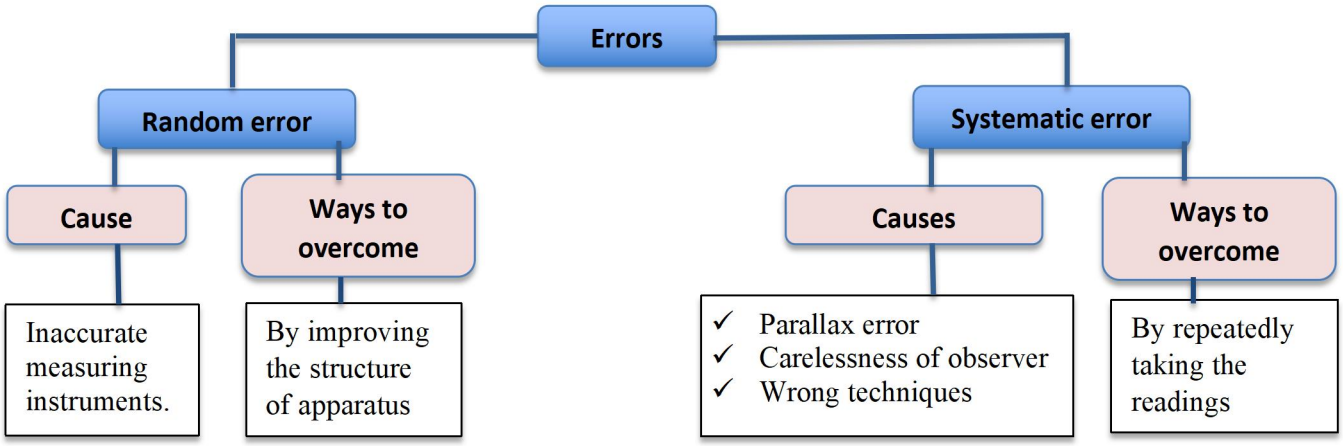
1. Get the teacher's permission before entering the laboratory.
2. Do not eat, drink and play in the laboratory.
3. Do not bring chemicals or apparatus out of the laboratory.
4. Wash and store all the apparatus out of the laboratory.

Physical Quantities:

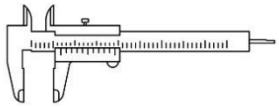
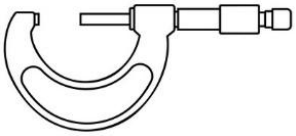
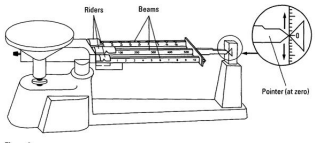
Base quantity	S.I. unit	Symbol for the unit
Length	Metre	m
Mass	Kilogram	kg
Time	Second	s
Temperature	Kelvin	K
Electric current	Ampere	A

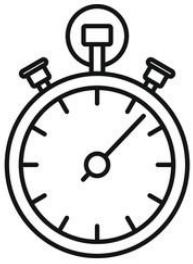
Prefix Value:

Prefix	Symbol	Value	Standard form
giga	G	1 000 000 000	10^{9}
mega	M	1 000 000	10^{6}
kilo	K	1 000	10^{3}
deci	D	0.1	10^{-1}
centi	C	0.01	10^{-2}
milli	M	0.001	10^{-3}
micro	μ	0.000 001	10^{-6}
nano	n	0.000 000 001	10^{-9}



Using of more accurate measuring instruments:

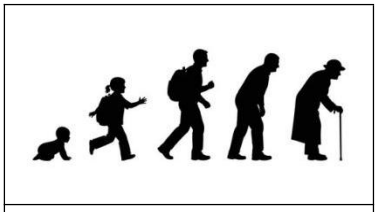
Vernier callipers	Micrometer screw gauge	Lever balance	Triple beam balance
			
Measure the thickness and diameter of small objects more accurately.		Measure the mass of objects.	

Stopwatch	Ammeter	Thermometer
		
Recording the time	Measure the electric current	Measure the body temperature

Sumber: SPS Sains Tingkatan 1 (Nota), Sasbadi

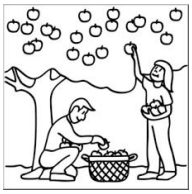
Section A
(10 marks)

1. Which of the following is a natural phenomenon?

A 

B 

C 

D 

[Remembering]

2. Which of the following are the field of science?

P – Biology
Q – Literature
R – Meteorology
S - Broadcasting

A P and Q
B R and S
C P and R
D Q and S

[Remembering]

3. The information below describes Mr Siva's career.

Study the events that occur in outer space.

Which of the following is Mr Siva's career?
A Chemist
B Geologist
C Pharmacist
D Astronomer

[Understanding]

4. Which of the following hazard symbols is used to label corrosive chemicals?

A 

B 

C 

D 

[Remembering]

5. Which of the following is the prefix value of kilo?

A 0.01
B 1000
C 0.001
D 1 000 000

[Remembering]

6. Which of the following are the correct matches of base quantities and their S.I. units?

	Temperature	Mass
A	Kilogram	Metre
B	Second	Kelvin
C	Metre	Ampere
D	Kelvin	Kilogram

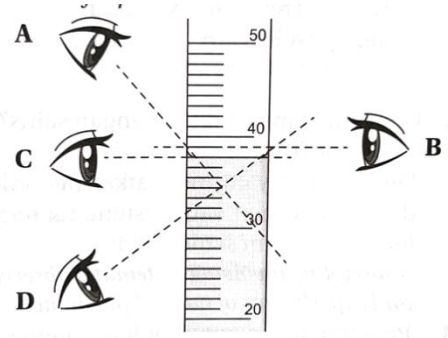
[Understanding]

7. A student wants to measure the length of a river on a map. Which of the following instruments should be used?

A Measuring tape
B Thread and ruler
C Vernier callipers
D External callipers and ruler

[Applying]

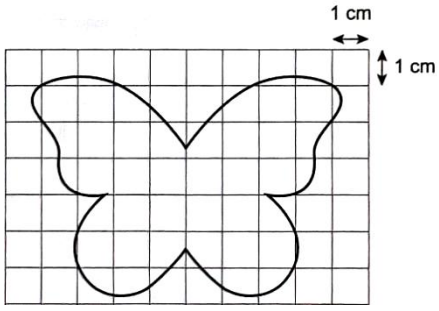
8. Diagram shows the method to measure the volume of liquid.



Which position of the eye at A, B, C or D shows the correct method when taking the reading of the volume of liquid?

[Applying]

9. Diagram shows the area of a shape measured using a graph paper.

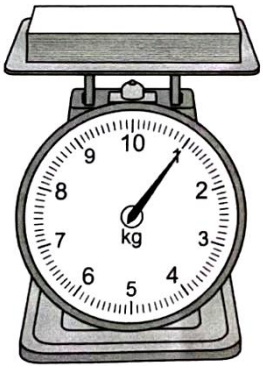


What is the area of the shape?

A 30 cm^2
B 34 cm^2
C 37 cm^2
D 39 cm^2

[Applying]

10. Diagram shows the mass of 50 sheets of paper.



What is the mass of one sheet of paper?

A 5 g
B 10 g
C 15 g
D 20 g

[Applying]

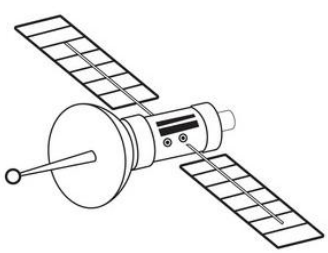
Section B
(16 marks)

1.a) Mark (✓) the correct fields in science and their related careers.

					
Physics		Biology		Chemistry	

[2 marks]
[Remembering]

b) Diagrams show the contributions of science and technology.

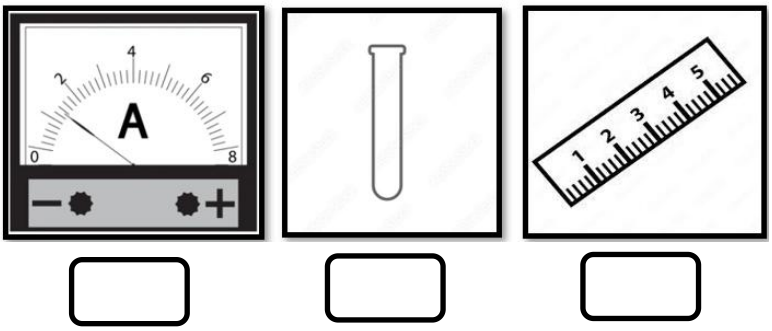
		

Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Invention of satellites has made communication more effective and faster.	
ii) Discovery of vaccines in the field of medicine increases death rate.	
iii) Agricultural drones assist in crop spraying, field mapping, and yield estimation.	

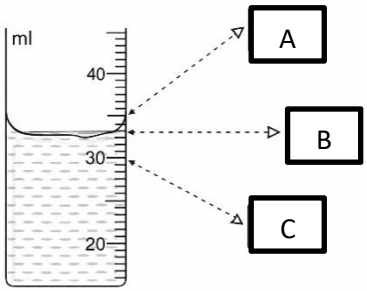
[2 marks]
[Understanding]

2.a) Mark (✓) on the measuring tools that are used in the science laboratory.



[2 marks]
[Remembering]

b) Diagram shows a type of error that commonly occurs when taking measurements.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) This error occurs when a measurement is taken at A and C.	
ii) The correct eye position when taking the measurement is at B.	
iii) This error is caused by faulty measuring instruments.	

[2 marks]
[Understanding]

3.a) Underline the correct answers about the rules and safety measures in laboratories.

i) Eating is (allowed, prohibited) in the laboratory.
ii) Keep highly flammable chemicals away from any (heat, sound) sources.

[2 marks]
[Remembering]

b) Diagram shows an apparatus in a science laboratory.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) This apparatus is used to measure the volume of liquid accurately.	
ii) This apparatus can measure volumes more accurate than a measuring cylinder.	
iii) The scale on the apparatus starts from zero at the bottom and increases upward.	

[2 marks]
[Understanding]

4.a) Diagram shows two hazard symbols.

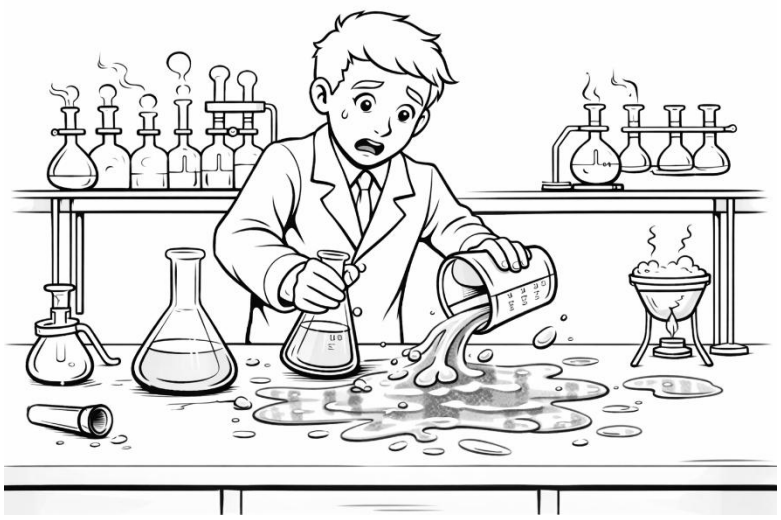
	

Label the hazard symbols using the words given below.

Explosive	Corrosive	Flammable

[2 marks]
[Remembering]

b) Diagram shows an accident occurred in the science laboratory.



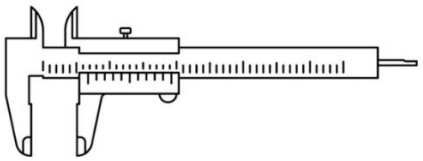
Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) The student should inform the teacher immediately after the spill.	
ii) It is safe to touch spilled chemicals with bare hands.	
iii) Follow laboratory safety rules to prevent accidents.	

[2 marks]
[Understanding]

Section C
(10 marks)

1. Diagram shows a measuring instrument.



a) Mark (✓) two types of scales found on the instrument above.

Main scale	Vernier scale	Digital scale

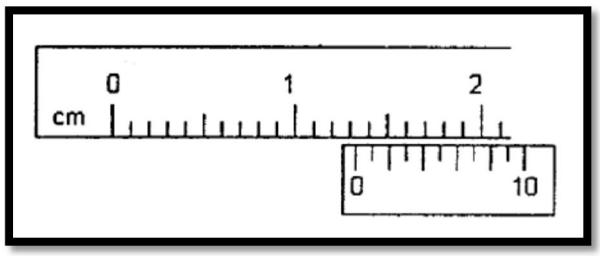
[2 marks]
[Remembering]

b) State two examples of objects that can be measured by using the instrument.

_____

[2 marks]
[Understanding]

c) Diagram shows the reading of the thickness of a science textbook using vernier callipers.



Calculate the measurement reading shown in the diagram above.

Actual reading = Reading of vernier callipers – zero error

[3 marks]
[Applying]

d) Eva and Lila are making chocolate cookies. Eva uses a normal cup to measure the ingredients, while Lila uses a digital kitchen scale. Unfortunately, chocolate cookies made by Eva do not turn out well. Explain.

_____

_____

_____

[3 marks]
[Analysing]

A3: Assessment

1. Based on the options of answers given, fill in the blanks for the following statements.

Transportation	Medicine	Agriculture	Engineering
Satellite	Information technology and communication		Vaccine and antibiotic

a) _____ such as ETS enables us to reach a destination easily and quickly.

b) The discovery of _____ in _____field enables us to live healthier by curing the diseases we suffer from.

c) _____ field is important to supply food for us.

d) The invention of _____, internet and e-mail in _____ field results in a more effective communication.

e) A rapid development in _____ field allows the engineers to build many skyscrapers.

[7 marks]
[Understanding]

2. Based on the functions given, state the corresponding apparatus.

Functions	**Apparatus**
a) Measuring the volume of liquid	
b) Supports the apparatus during heating	
c) Hold or support the apparatus	
d) Heating chemicals in small quantities	
e) Fill chemicals in large quantities	

[5 marks]
[Remembering]

3. Convert the base quantity units below.

a) 55 kg = _____ gram	b) 6 600 cm = _____ meter
c) 28 800 s = _____ hour	d) 0.009 m = _____ μm

[4 marks]
[Applying]

Session 2	
Learning Area	1.0 INTRODUCTION TO SCIENTIFIC INVESTIGATION
Content Standard	1.5 Density 1.6 Steps in a Scientific Investigation 1.7 Scientific Attitudes and Values in Carrying Out Scientific Investigations
Learning Objective	Students will be able to accomplish tasks related to density, steps in a scientific investigation and scientific attitudes and values in carrying out scientific investigations.
Learning Focus	1. Calculation of density using formula 2. Scientific method 3. Scientific attitudes and moral values
Teaching Aids	1. Smart Learning Notes (refer to A1) 2. Technique of answering (refer to A2) 3. UASA-format items Enhancement Exercises (refer to A3) • Fact/knowledge (content) • Science process skill 4. Assessment (refer to A4) 5. Answer scheme (Refer to A5)

A1: Smart Learning Notes

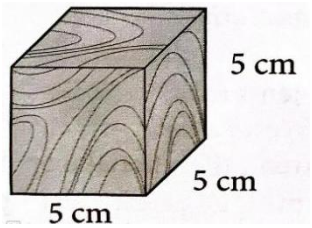
Density

1. Density is the mass per unit volume of a substance.

2. Formula for density:

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Example: The wooden block below has a mass of 300 g. Calculate the density of the wooden block.



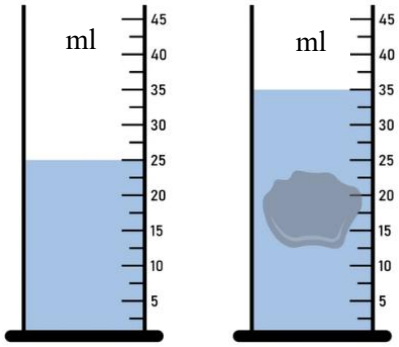
$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

$$= \frac{300\ \text{g}}{5\ \text{cm X}\ 5\ \text{cm X}\ 5\ \text{cm}}$$

$$= 2.4\ \text{g/cm}^3$$

3. The water displacement method is used to determine the density of uneven objects.

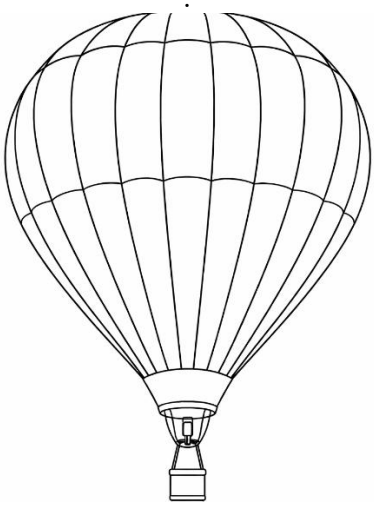
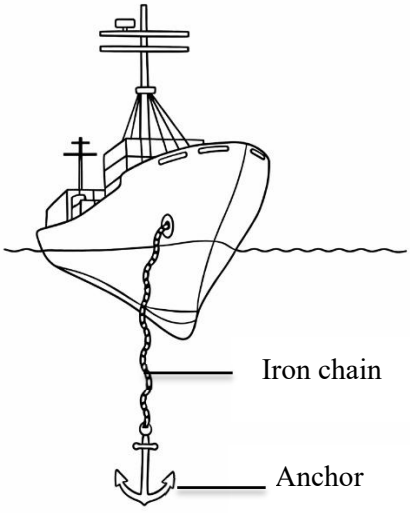
Example:



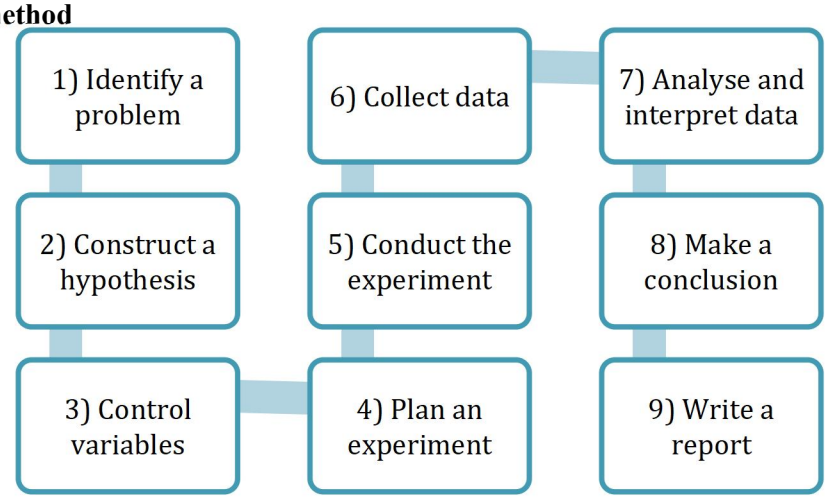
Volume of the plasticine = (35 – 25) ml

= 10 ml

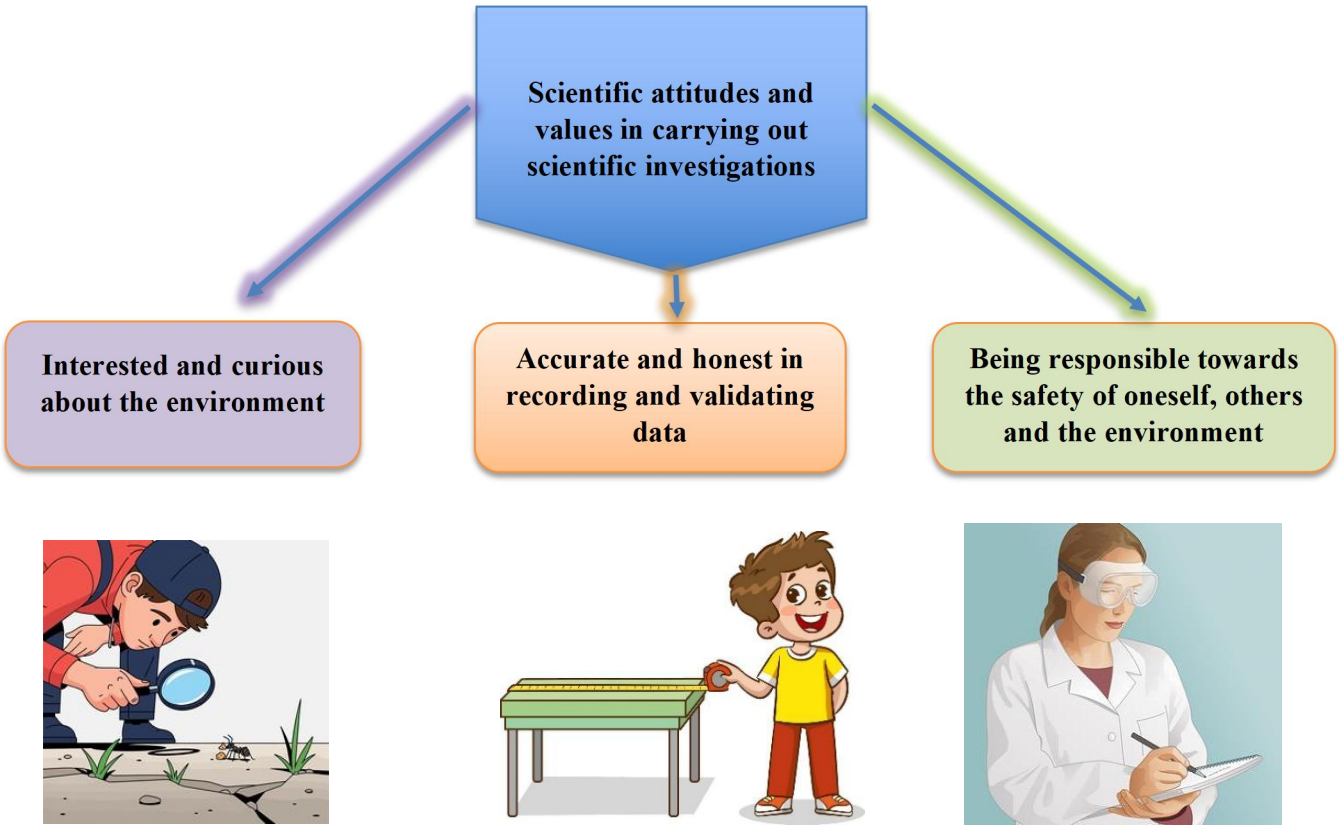
4. Application of density in daily life

Hot air balloon rise as hot air is less dense than normal air.	Denser anchor is dropped to the seafloor to anchor the ship from moving to another place due to the waves and wind.
	

Scientific method



Scientific attitudes and moral values



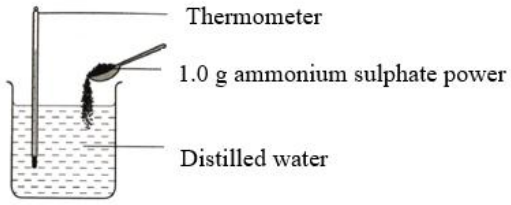
Sumber: Module Perfect, Nusamas

A2: Technique of Answering

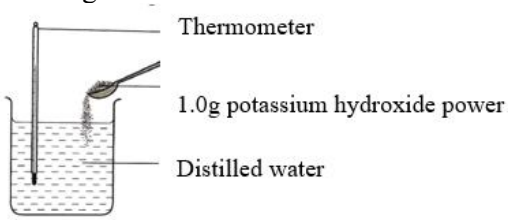
Science Process Skills

Example:

1) Diagram shows two experimental set-ups to study the heat change in chemical reactions.



Set I



Set II

a) Table shows collected data for both chemical reactions.

Set I

Initial thermometer reading	27.5℃
Final thermometer reading	23.0℃

Set II

Initial thermometer reading	27.5℃
Final thermometer reading	31.0℃

State the observations collected on chemical reactions Set I and Set II.

Set I: Temperature drops 4.5℃

Set II: Temperature increases 3.5℃

Observe the changes in the initial and final temperatures

[2 marks]
[Observing]

b) State the inferences for chemical reactions Set I and Set II.

Set I: Temperature drops 4.5℃ because the chemical reaction absorbs heat from distilled water

Set II: Temperature increases 3.5℃ because the chemical reaction releases heat into distilled water

Inference: Observation + Explanation to the observation

[2 marks]
[Making inference]

c) State the variables:

i) Manipulated: Type of substance added into distilled water

ii) Responding: Temperature change of water

[2 marks]
[Controlling the variables]

Manipulated variable
Aspect/factor that is purposely changed on apparatus

Responding variable
Aspect/factor that is observed and recorded

Constant variable
Aspect/factor that is unchanged/remained

d) Predict the final thermometer reading if chemical reaction Set II is repeated using double the quantity of potassium hydroxide powder.

The final temperature becomes more than 31℃

Making a reasonable forecast based on given information or patterns

[1 mark]
[Predicting]

e) State a precautionary step when conducting this experiment.

Stir the mixture evenly before the reading of thermometer is taken

Step to be taken to ensure valid reading of thermometer

[1 mark]
[Experimenting]

Sumber: Module Perfect, Nusamas

A3: UASA-format items Enhancement Exercises

Section A
(10 marks)

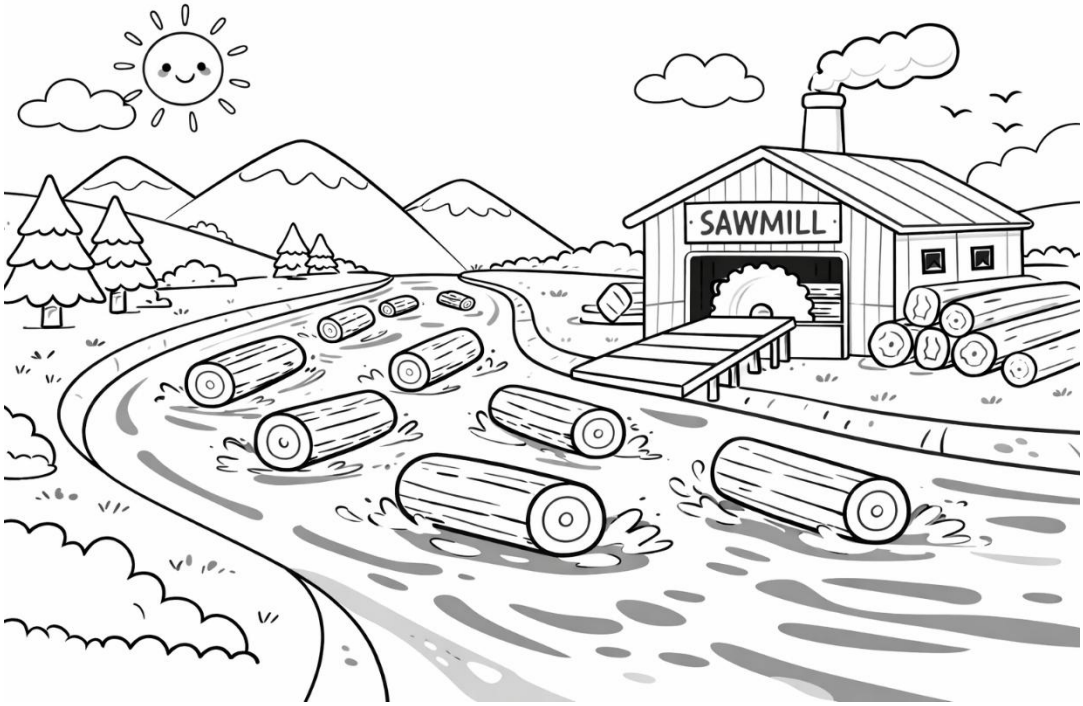
1. What is the unit for density?

A g
B kg
C m^3
D gcm^{-3} [Remembering]

2. What happen to the density if the mass of an object increases and the volume remains constant?

A Increases
B Decreases
C Become zero
D Remain the same [Understanding]

3. Diagram shows a human activity near a sawmill factory.



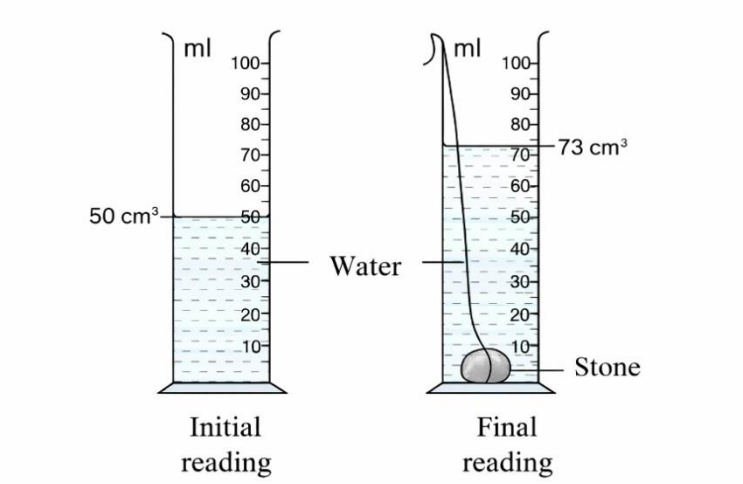
How is this method can help in transporting the load to the destination?

A Logs are denser than water
B Water is less dense than logs
C Logs are less dense than water
D Water and logs have the same density [Understanding]

4. Which of the following methods is suitable to determine the density of irregular objects?

A Graph paper method
B By measuring its density
C Water displacement method
D Using a formula to calculate the volume [Understanding]

5. Diagram shows the method to determine the volume of a stone.



The density of the stone is 2.1 gcm^{-3}. What is the mass of the stone?

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

A 10.95 g
B 48.30 g
C 105.0 g
D 153.3 g

[Applying]

6. Information below shows the steps in a scientific investigation.

W – Collecting data

X – Identifying the problem

Y – Forming a hypothesis

Z – Make a conclusion

Which of the following shows the correct sequence of the steps?

A W, X, Y, Z
B X, Y, W, Z
C X, W, Y, Z
D Y, X, Z, W

[Understanding]

7. Which of the following steps will influence the results of the experiment?

A Collecting data
B Preparing the report
C Identifying the problem
D Controlling the variables

[Analysing]

8. Table shows the height of the plant for five days.

Day	Height of plant (cm)
1	5
3	8
5	11

What step in scientific investigation is involved in the activity?

A Collecting data
B Making inference
C Making hypothesis
D Drawing conclusion

[Remembering]

9. What is the best practice in scientific investigation involving data recording?

A Ignoring results that seem incorrect
B Changing data to match expected outcomes
C Recording only results that support the hypothesis
D Recording all observations, including unexpected results

[Understanding]

10. What is the moral value shown by the students when cleaning the apparatus after the experiment?

A Curious
B Cooperative
C Hardworking
D Responsible and caring

[Understanding]

Section B
(12 marks)

1.a) Underline the correct answers.

i) (Hypothesis, Report) is a suggestion which has not been proven to be right or wrong and must be tested through an experiment.

ii) Measurements are carried out at least three times to obtain a more (accurate, precise) reading.

[2 marks]
[Remembering]

b) Diagram shows two different types of materials used to absorb water.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Tissue paper absorbs water faster than a cloth towel.	
ii) Tissue paper and cloth towel absorb water at the same rate.	
iii) The rate of absorption is not affected by the thickness of the material.	

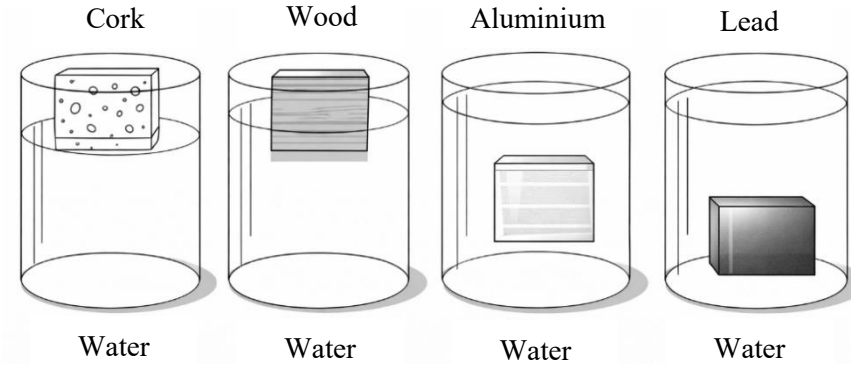
[2 marks]
[Understanding]

2.a) Mark (✓) the factors that affect density.

Mass	Temperature	Volume

[2 marks]
[Remembering]

b) Diagram shows four substances with different densities.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Cork floats on water because it has a lower density than water.	
ii) Wood has the same density as water because it floats partially.	
iii) Lead sinks to the bottom because it has a higher density than water.	

[2 marks]
[Understanding]

3a) Underline the correct answers for the statements below.
i) Demonstrate (curiosity, uncertainty) by asking questions and wanting to learn more.
ii) Record all observations accurately during an experiment to show (teamwork, honesty)

[2 marks]
[Remembering]

b) Diagram shows an activity carried out by a student.



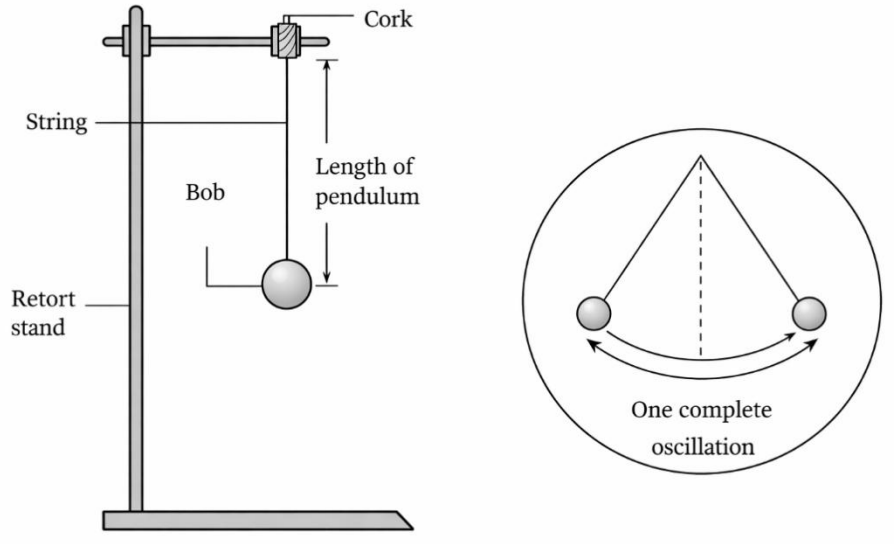
Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Objects can only be classified by their colour.	
ii) All objects must be classified using only one property.	
iii) Classifying helps us to organise and understand objects better.	

[2 marks]
[Understanding]

Section C
(8 marks)

1. A scientific investigation is carried out to study the relationship between the length of pendulum and the time taken for the pendulum to make 10 complete oscillations.



The results are shown in the table below.

Length of pendulum (cm)	Time for 10 oscillations (s)
20	9.0
30	11.0
40	12.5
50	14.0

a) State the relationship between the length of the pendulum and the time taken to make one complete oscillation.

_____

[1 mark]
[Interpreting data]

b) State the variables

i) Manipulated: _____

ii) Responding: _____

[2 marks]
[Controlling the variables]

c) Predict the time taken for 10 oscillations if the length of the pendulum is 60 cm.

_____

[1 mark]
[Predicting]

d) State two precautionary steps when carrying out this experiment.

_____

_____

[2 marks]
[Experimenting]

e) State the operational definition of the time of oscillation in this experiment.

_____

[1 mark]
[Defining operationally]

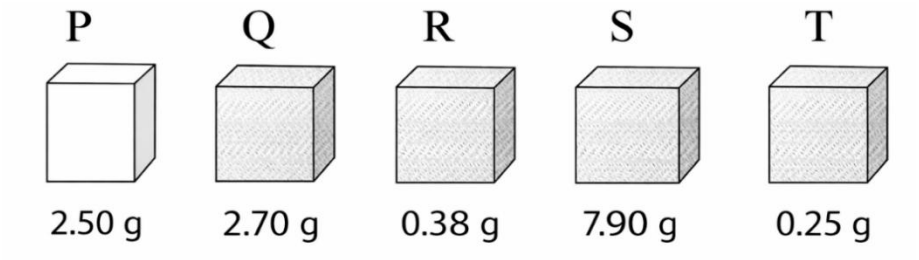
f) Is the experiment conducted fair? Explain.

_____

[1 mark]
[Experimenting]

A4: Assessment

1. The following diagram shows the mass of five cubes with a respective volume of 1 cm^3.



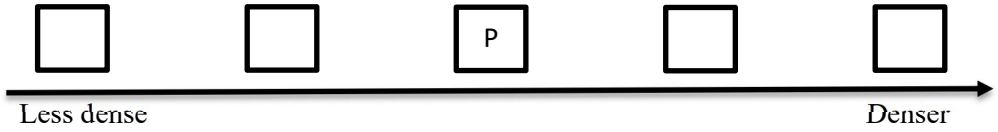
a) Based on the information given, calculate the density of each cube.

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Cube	Density (g/cm^3)
P	
Q	
R	
S	
T	

[5 marks]
[Applying]

b) Arrange the cubes above based on their densities in ascending order.



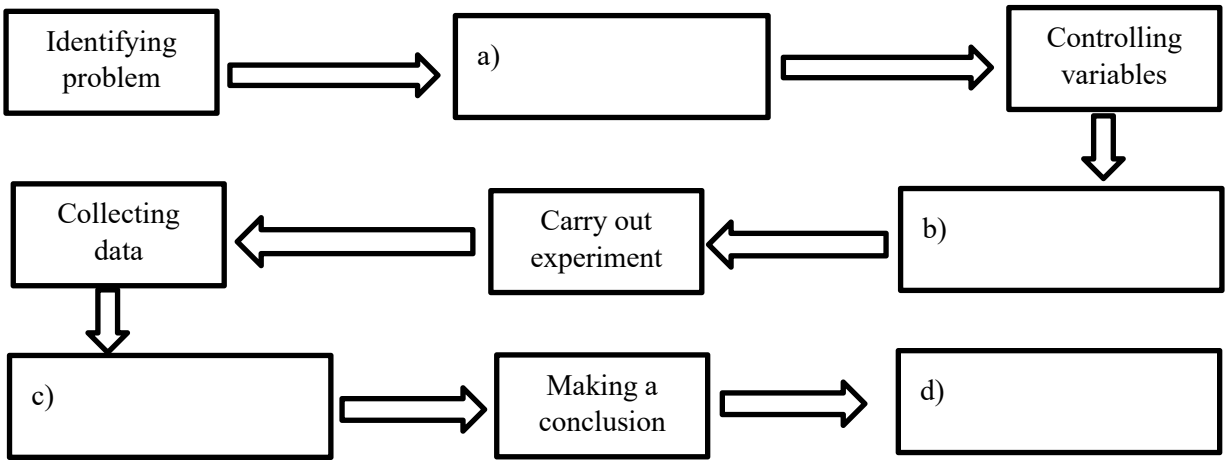
[4 marks]
[Applying]

c) Complete the table to show the condition of the cubes when they are placed in water.
(Density of water is 1 g/cm^3)

Cube	Sink / Float
P	
Q	
R	
S	
T	

[5 marks]
[Applying]

2. Complete the flow map below to show the steps involved in a scientific investigation.



[4 marks]
[Understanding]

3. Based on the options of answers given, fill in the blanks for the following statements.

critical	**honest**	**safety**	**environment**
interest	**accurately**	**curiosity**	

a) Many scientific discoveries begin with the _____ and _____ of scientists towards their surroundings.

b) We need to be _____ and record the readings _____.

c) Analytical and _____ thinking is important when planning an investigation.

d) While carrying out an experiment, we should be responsible for our _____, the others, as well as the _____.

[7 marks]
[Applying]

Session 3	
Learning Area	2.0 CELL AS THE BASIC UNIT OF LIFE
Content Standard	2.1 Cell – structure, function and organization 2.2 Cell respiration and photosynthesis
Learning Objective	Students will be able to accomplish tasks related to cell – structure, function and organisation and explain how cell respiration and photosynthesis provide energy for living organisms
Learning Focus	1. Cell structures and functions, unicellular and multicellular organisms, cell organisation, human body system. 2. Definition, word equation and comparison of cell respiration and photosynthesis.
Teaching Aids	1. Smart Learning Notes (refer to A1) 2. Technique of answering. (Refer to A2). 3. UASA-format items Enhancement Exercises (refer to A3) • Fact/knowledge (content) • Science process skill 4. Assessment (refer to A4) 5. Answer scheme (Refer to A5)

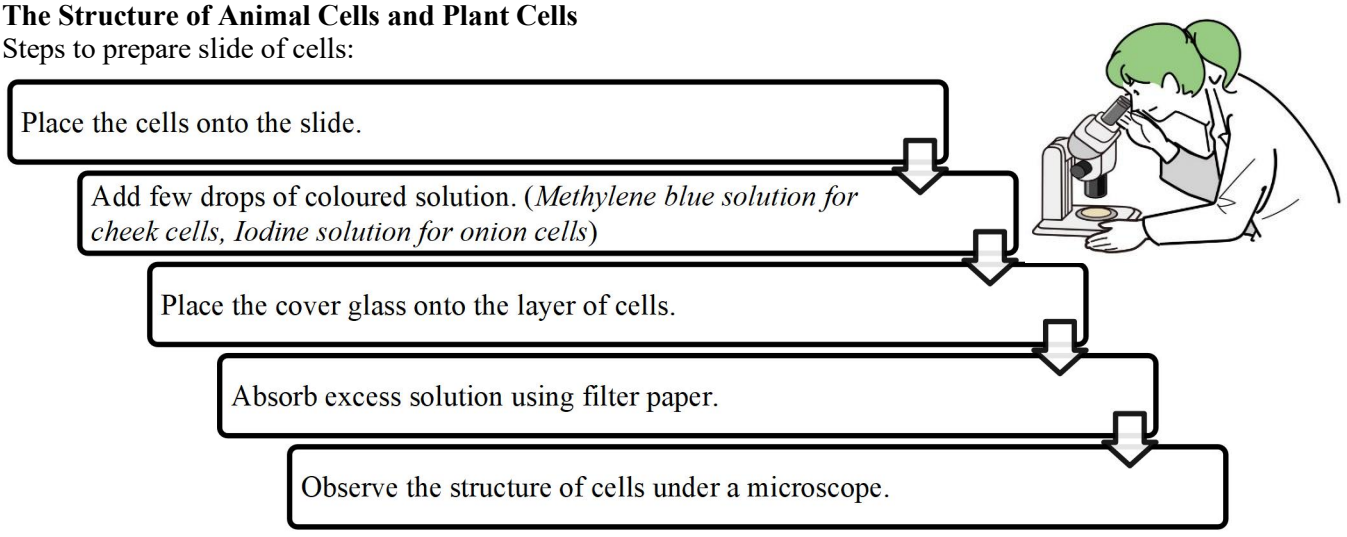
A1: Smart Learning Notes

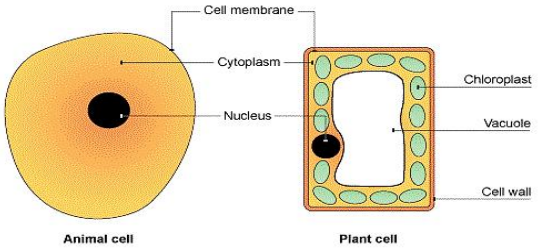
2.1 Cell – Structure, Function and Organization

Cells are the basic units of living things.
Cells carry out all functions of life such as growth, respiration, reproduction and excretion.
Cells undergo division process to form new cells or replace damaged cells.
Cancer happens when cells keep dividing without stopping or control.

The Structure of Animal Cells and Plant Cells

Steps to prepare slide of cells:





Source: https://igbiologyy.blogspot.com/2012/11/14-cell-structure.html

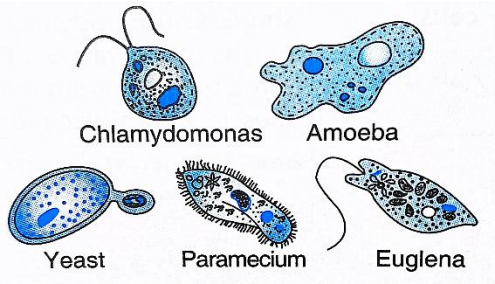
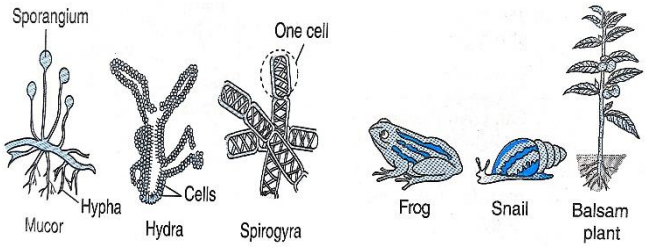
Functions of structures in animal cells and plant cells:

Structure	Function
Nucleus	Controls all activities in the cell and contain genetic information.
Cell membrane	Controls the flow of substances in and out of the cell.
Cytoplasm	Acts as a medium where chemical reactions occur.
Mitochondria	Produces energy for reaction in the cell.
Cell wall	Fixed the shape of the cell. Provides support and protection to the cell.
Chloroplast	Absorbs sunlight for the process of photosynthesis.
Vacuole	Provides support to cells when filled with cell sap.

Comparison between animal cells and plant cells

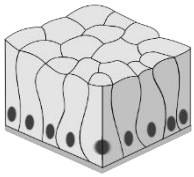
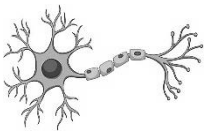
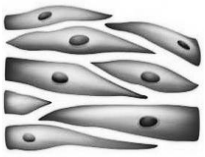
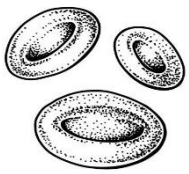
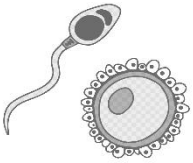
Structure	Shape	Chloroplast	Vacuole	Cell wall	Nucleus	Mitochondria	Cytoplasm
Animal cell	Not fixed	×	×	×	✓	✓	✓
Plant cell	Fixed	✓	✓	✓	✓	✓	✓

Unicellular organisms and Multicellular organisms

Unicellular organisms	Multicellular organisms
Have one cell only	Have more than one cell
Very small and can only be seen under the microscope.	Complex organisms but there are also microscopic organisms such as hydra, mucor and spirogyra.
Examples:  	Examples:  *Source: Revisi Cepat PT3 KSSM F1,2,3 (Ilmu Bakti)*

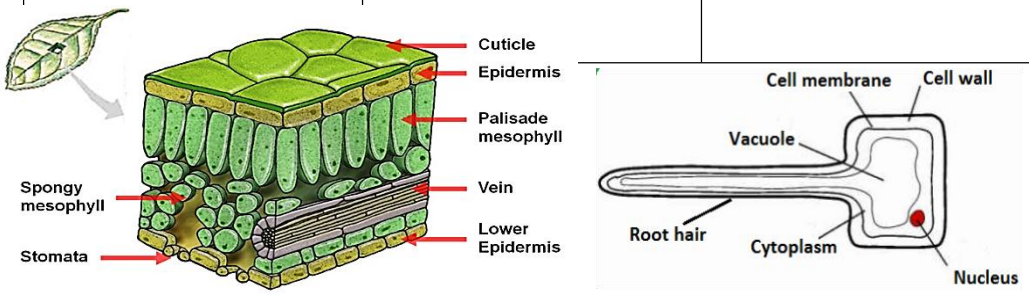
The Types and Functions of Animal Cells and Plant Cells

Types of animal cells:

Epithelium cells	Nerve cells	Muscle cells	Red blood cells	White blood cells	Reproductive cells
					
Form a layer that protects organs in the body and secrete mucus.	Carry information in the form of impulse.	Contract and relax to enable movement.	Contain haemoglobin to transport oxygen.	Surround foreign particles and destroy them.	Sperm carry male genetic materials and an ovum carries female genetic materials.

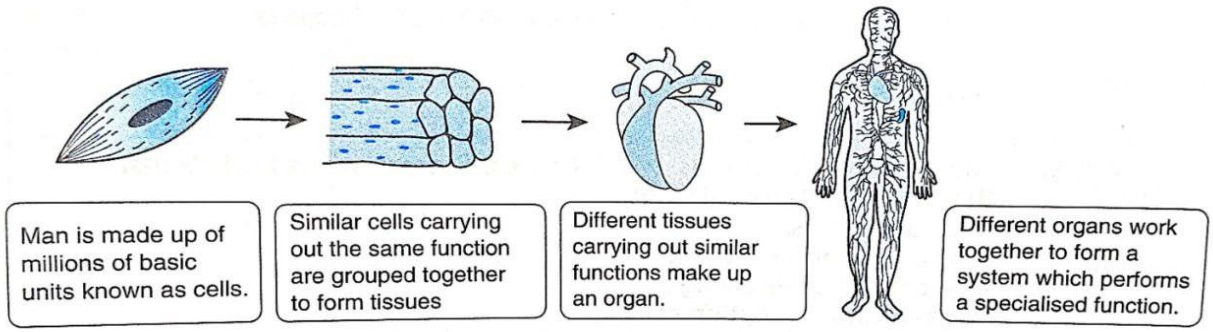
The types of plant cells:

Epidermal cells	Palisade cells	Guard cells	Root hair cells
The outermost layer cells that cover the leaves, flowers, roots and stems. To prevent water loss, control the exchange of gases and absorption of water and nutrients.	Long and vertical. Contain chlorophyll to absorb sunlight to carry out photosynthesis.	Found in epidermis of leaves, stems and other parts of plant. Control the opening and closing of stoma.	Grow at the root tip of the plant. Absorbs water and nutrient from the soil.



Source: https://www.pathwayz.org/Tree/Plain/CROSS+SECTION+OF+A+LEAF+%5BBASIC%5D

Cell organisation



Source: Revisi Cepat PT3 KSSM F1,2,3 (Ilmu Bakti)

Cells ➔ Tissues ➔ Organs ➔ Systems ➔ Organism

Various systems in human body and its function.

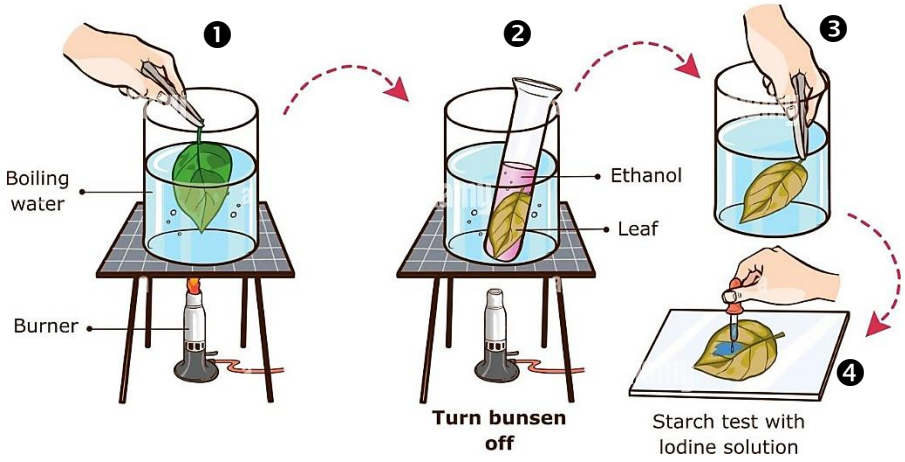
System	Function
Nervous system	Carries information from the brain to the entire body in the form of impulse.
Skeletal system	Supports the body and protects the inner organs such as the lung and heart.
Excretory system	Removes waste products and excess water from the body.
Lymphatic system	Drains lymphatic fluid into blood vessels to protect the body from infections of bacteria, virus and others.
Digestive system	Breaks down complex food into simpler form so that it is more easily absorbed by the body.
Muscular system	Helps in the movements of the body and inner organs.
Integumentary system	Protects the body from dehydration and regulates body temperature.
Blood circulatory system	Carries oxygen, nutrients and hormones to all parts of the body. Transports waste products to excretory organs.
Respiratory system	Absorbs oxygen and releases carbon dioxide from the body.
Endocrine system	Produces hormones required to coordinate reactions in the body.
Reproductive system	Produces sperms and ovum to produce offspring.

2.2 Cell Respiration and Photosynthesis

Differences between cell respiration and photosynthesis:

Cell Respiration	Aspect	Photosynthesis
Mitochondria	Location	Chloroplast
Release energy	Energy transfer	Absorb energy
Chemical energy in food	Energy source	Sunlight
Breakdown of glucose	Process involved	Synthesis glucose
Oxygen and glucose	Reactants	Carbon dioxide and water
Carbon dioxide, water and energy	Products	Oxygen and glucose
Humans, animals and plants	Occurs to	Plants and microorganisms
All times	Time occurs	In the presence of sunlight
Glucose + Oxygen → Carbon dioxide + water + energy	Word equation	Carbon dioxide + Water $\xrightarrow[Chlorophyll]{Sunlight}$ Glucose + Oxygen

Test for the Presence of Starch



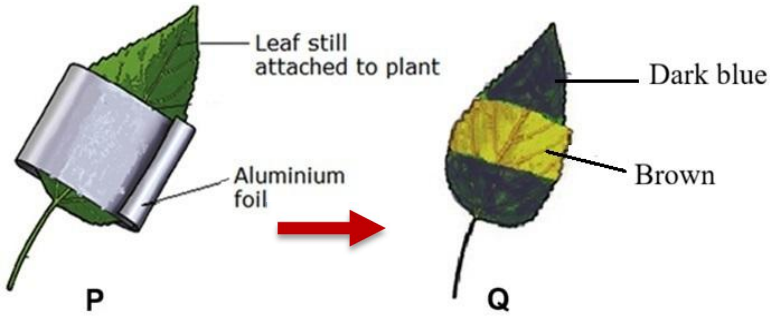
1. The leaf is placed in boiling water to **soften** the leaf and **break** the cell.
2. The leaf is put in a boiling tube filled with ethanol, placed the boiling tube in water bath. This is to **dissolve and remove chlorophyll.**
3. The leaf is placed in hot water to **remove ethanol.**
4. A few drops of iodine are added onto the leaf. The leaf **turns dark blue, if starch is present.**

Source: https://www.alamy.com/stock-photo/leaf-starch-test.html

A2: Technique of answering

Science Process Skills
Example:

Diagram shows the apparatus set-up to study the need of light energy in photosynthesis. Iodine test is carried out on the leaf after 3 days.



Source: https://freehighschoolscience.wordpress.com/2019/02/25/starch-test-experiment/

(a) State the observation of this experiment.

The uncovered part of the leaf turns blue-black while the covered part remains brown.

What can be observed in the diagram after Iodine test is carried out on the leaf?

[1 mark]
[Observing]

(b) State the inference based on the observation in (a).

The uncovered part of the leaf turns blue-black because starch is present.

Inference: Observation + Explanation to the observation

[1 mark]
[Making inference]

(c) Identify the variables for the experiment:

(i) Manipulated variable:
Presence of sunlight.

(ii) Responding variable:
Presence of starch on the leaf

(iii) Constant variable:
Type of plant / Duration of exposure to sunlight

Manipulated variable
Aspect/factor that is purposely changed on apparatus
Responding variable
Aspect/factor that is observed and recorded
Constant variable
Aspect/factor that is unchanged/remained

[3 marks]
[Controlling the variables]

(d) State a precaution when carrying out the experiment?

Keep two similar plants in a dark place for two days to remove the starch.

Refer to the steps to be taken to gain valid results

[1 mark]
[Experimenting]]

(e) Predict the observation when this experiment is carried out at midnight. Explain your answer.

Prediction : No colour change is observed/ Iodine solution remains brown.
Explanation: At midnight, there is no light. Therefore, photosynthesis does not occur, and no starch is produced

Explain based on the result or data collected

[2 marks]
[Interpreting data]

(f) State a conclusion for this experiment.

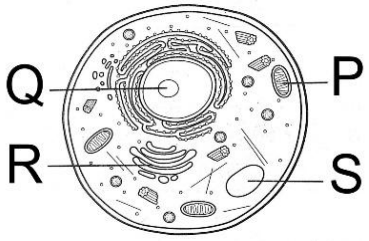
Light energy is needed in photosynthesis.

Refer to Hypothesis
- shows the relationship between manipulated variables (MV) and responding variables (RV)

[1 mark]
[Making conclusion]

A3: UASA-format items Enhancement Exercise
Section A
(5 marks)

1. Diagram shows the structure of an animal cell. [Remembering]



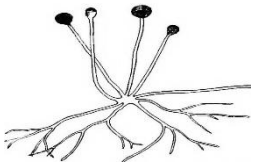
Which of the following produces energy for chemical reactions in cell?

A P
B Q
C R
D S

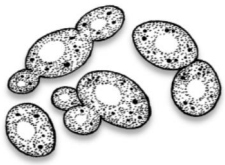
2. Which of the following is paired correctly about the difference between animal cells and plant cells? [Analysing]

	Animal cells	Plant cells
A	Have chloroplast	Do not have chloroplasts
B	Do not have vacuoles	Have vacuoles
C	Have cell walls	Have no cell walls
D	Do not have cytoplasm	Have cytoplasm

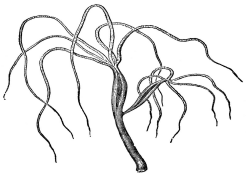
3. Diagram shows four types of living organisms. [Analysing]



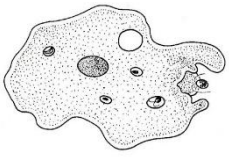
J



K



L



M

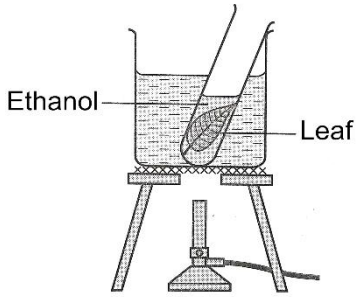
Which of the following is classified correctly into unicellular and multicellular organisms.

	Unicellular	Multicellular
A	J, M	K, L
B	J, L	K, M
C	J, K	L, M
D	K, M	J, L

4. Which of the following is true about cell respiration? [Remembering]

   A The process of energy absorption by body cells.
   B The process of produces energy, oxygen and water.
   C The process of oxidation and decomposition of glucose.
   D The process of gaseous exchange between organisms and environment.

5. Diagram shows the apparatus set up to test the presence of starch in leaves. [Understanding]

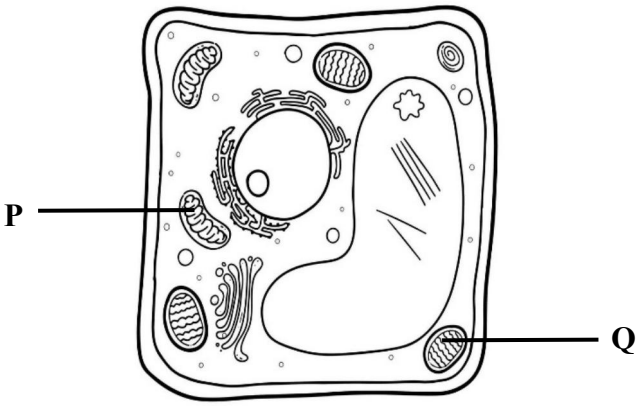


What is the function of ethanol?

   A Soften the leaf.
   B Dissolves the starch in the leaf.
   C Breaks down the cells in the leaf.
   D Removes the chlorophyll in the leaf.

Section B
(20 marks)

1. Diagram shows a plant cell.



(a) Label the parts P and Q using the words given.

Mitochondria	Nucleus	Chloroplast

(i) P: _____ (ii) Q: _____

[2 marks]
[Remembering]

(b) Based on the diagram above, mark (✓) the correct statements about P and Q.

Statements	Mark (✓)
(i) P controls all activities of a cell.	
(ii) P produces energy for reactions.	
(iii) Q absorbs light energy for photosynthesis.	

[2 marks]
[Understanding]

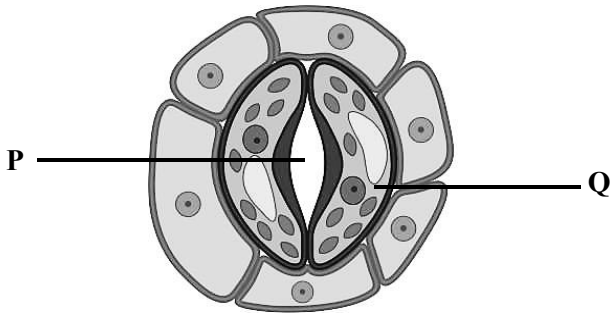
2. (a) Fill in the blanks with the words given.

(i) Nerve cells play an important role in carrying impulses to the _____ to be interpreted.
(ii) Nerve cells contain long _____ to carry information througout the body.

spinal cord	fibres	brain

[2 marks]
[Remembering]

(c) Diagram shows the structures P and Q in a plant cell.

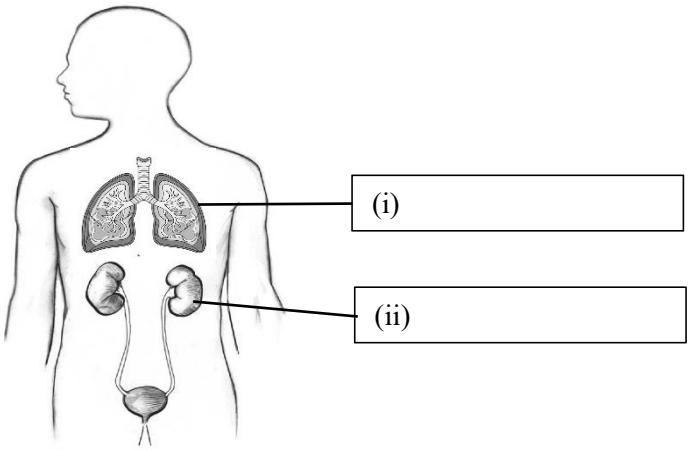


Mark (✓) for the correct statements about P and Q.

Statements	Mark (✓)
(i) P is a pore that opens during the day to carry out photosynthesis.	
(ii) Q controls the closing and opening of the stoma based on the concept of osmosis.	
(iii) P releasing carbon dioxide during photosynthesis.	

[2 mark]
[Understanding]

3. Diagram shows a human body system.



(a) Label the two organs in the system using the given words.

Lungs	Heart	Kidneys

[2 marks]
[Remembering]

(b) Mark (✓) two waste substances that are expelled by the excretory system.

Carbon dioxide	
Oxygen	
Urea	

[2 marks]
[Understanding]

4. (a) Fill in the blanks with the words given.

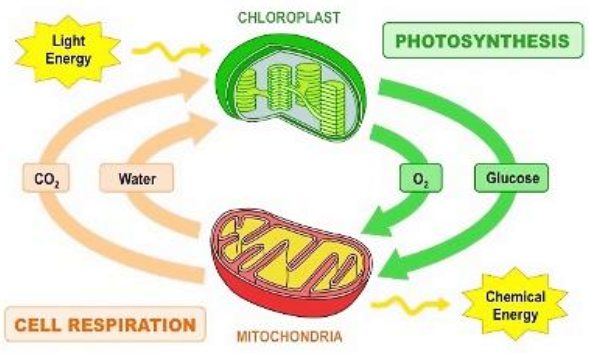
Carbon dioxide	Oxygen	Chlorophyll	Glucose

(i) During photosynthesis, plants need sunlight, ……., …… and water.

(ii) During cell respiration, organisms require …… and …….. that is produced through photosynthesis.

[2 marks]
[Remembering]

(b) Diagram shows cell respiration process.



Mark (✓) for the correct statements.

Statements	Mark (✓)
(i) Occurs in animals and humans only.	
(ii) The required substances are glucose and oxygen.	
(iii) Cell respiration produces carbon dioxide, energy and water.	

[2 marks]
[Understanding]

5. (a) Complete the word equation of photosynthesis using the words given.

Oxygen	Nitrogen	Carbon dioxide

(i) + Water $\xrightarrow[Sunlight]{Chlorophyll}$ Glucose + (ii)

[2 marks]
[Remembering]

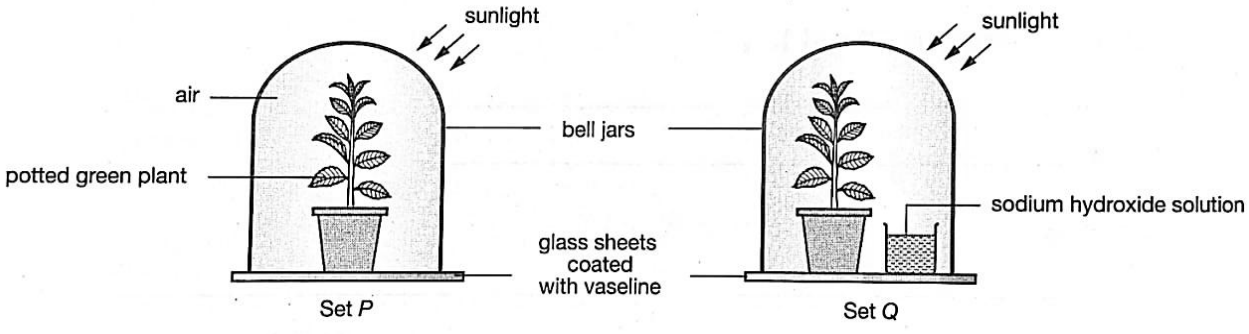
(b) Based on the word equation above, mark (✓) the correct statements about photosynthesis.

Statements	Mark (✓)
(i) A process to produce sugar.	
(ii) A process that absorbs energy from the Sun.	
(iii) Occurs in microorganism only	

[2 marks]
[Understanding]

Section C
(8 marks)

1. Diagram shows an experiment investigating the need of carbon dioxide in photosynthesis.



(a) After 4 days, Starch test is performed on the leaves of the plants in sets P and Q. Table shows the result of the experiment.

Set	Presence of carbon dioxide	Observation
P	Yes	Dark blue spot formed
Q	No	Iodine solution remains brown

State inferences for Set P and Q.

Set P : _____

Set Q : _____

[2 marks]
[Making inference]

(b) State related variables in this experiment:

(i) Manipulated variable : _____

(ii) Responding variable : _____

[2 marks]
[Controlling variables]

(c) Predict the observation of Iodine test if the Plant P is placed in the dark for a week. Explain.

_____

_____

[2 marks]
[Predicting]

(d) Sets P and Q are placed in a dark place for two days before the experiment is conducted. Explain.

_____

[1 mark]
[Experimenting]

(e) State a conclusion for this experiment.

_____

[1 mark]
[Making conclusion]

A4: Assessment

1. Identify the human body systems based on the descriptions given.

Descriptions	Human body systems
(a) The system protects the body from dehydration and regulates body temperature.	
(b) The system supports the body and protects the internal organs.	
(c) The system absorbs oxygen and releases carbon dioxide from the body.	
(d) The system breaks down complex food into simpler form so that it is absorbed easily by the body.	
(e) This system carries oxygen, nutrients and hormones to all parts of the body.	

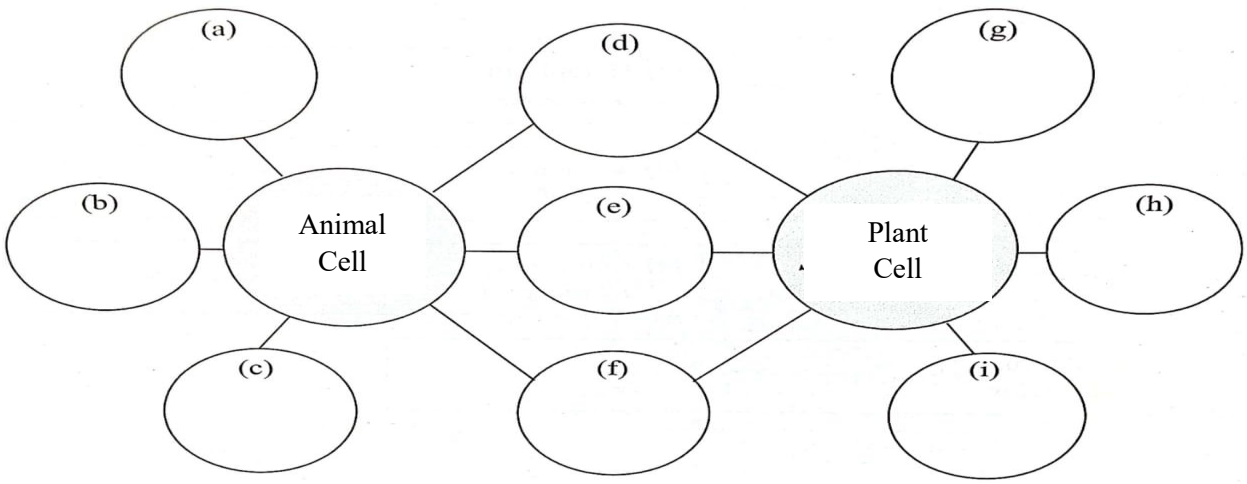
[Remembering]

2. State the functions of the cells below.

Types of cell	Functions
(a) Red blood cells	
(b) Muscle cells	
(c) Palisade cells	
(d) Guard cells	

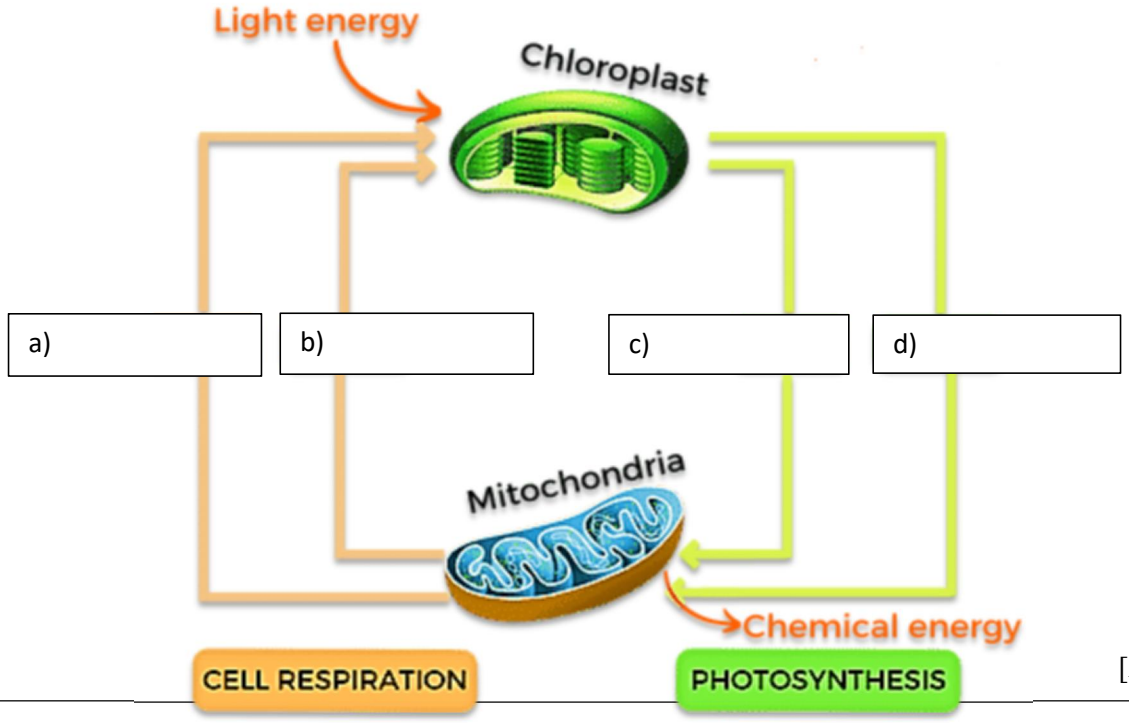
[Remembering]

3. Compare and contrast the animal cells and plant cells by completing the double bubble map below.



[Analysing]

4. Complete the diagram to show the complement of cell respiration and photosynthesis.



[Analysing]

Session 4	
Learning Area	3.0 Coordination and Response
Content Standard	3.1 Homeostasis in Living Things
Learning Objective	Student will be able to accomplish the tasks regarding the homeostasis in human, animal, plants.
Learning Focus	1. Humans, animals and plants homeostasis. 2. The importance of homeostasis in humans and living thing.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. Technique of answering. (Refer to A2) 3. UASA-format items Enhancement Exercises (Refer to A3) 4. Assessment (Refer to A4) 5. Answer scheme (Refer to A5)

A1: Smart Learning Notes





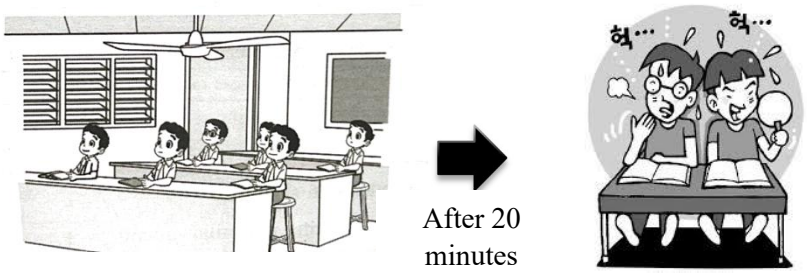

Temperature Regulation
in the Human Body
How does the body regulate temperature?
Hot Environment
Body temperature increases
Brain
(Hypothalamus)
Corrective Mechanisms
Blood vessels dilate
Hairs lie flat
Increase sweating
Muscles relax & hormonal activity decreases.
TEMPERATURE DECREASES
Normal Temperature 37°C
Cold Environment
Corrective Mechanisms
Blood vessels constrict
Hairs stand erect
Decrease sweating
Muscles shiver & hormonal activity increases.
TEMPERATURE INCREASES
Body temperature
Body temperature decreases
Skin
Kidneys
Skeletal Muscles
Systems involved: Skin, Kidneys, Skeletal Muscles


Regulation of Body Temperature
Maintaining a stable internal temperature
Keeps Cells & Enzymes Working Properly!
Too Hot!
Normal
Too Cold!
Examples of Homeostasis in Animals and Plants
Cats lick their fur to reduce the body temperature.
Dogs hang the tongue out to release hot air through their mouth.
Banana trees roll up the leaves during hot day to reduce the loss of water through transpiration process.

A2: Technique of answering

Science Process Skills

Diagram shows a study on how the biological action respond to the changes in temperature.



(a) State the observation of this study.

The students sweat when the fan is switched off.

What can be observed in the diagram?

[1 mark]
[Observing]

(b) State the inference based on the observation at (a).

The students sweat to cool down their body.

Inference: Observation + Explanation to the observation

[1 mark]
[Making inference]

(c) Identify the variables for the experiment.

(i) Manipulated variable
The surrounding temperature

(ii) Responding variable
Presence of sweat

(iii) Constant variable
Time taken

Manipulated variable:
Aspect/factor that is purposely changed on apparatus
Responding variable
Aspect/factor that is observed and recorded
Constant variable
Aspect/factor that is unchanged/remained

[3 marks]
[Controlling the variables]

(d) State one precautionary step that need to be taken when conducting this experiment.

Make sure that the time is the same for the fan been switched off and switched on.

Refer to the factors to be kept constant to gain valid results

[1 mark]
[Experimenting]

(e) State the operational definition for the body response towards temperature.

The body response towards temperature is a process in which the sweat presents when the surrounding temperature is high.

Operational definition: Observation + Condition/steps taken to produce the observation

[1 mark]
[Defining operationally

(f) State the conclusion of this experiment.

We sweat in a hot condition.

Refer to Hypothesis
- shows the relationship between manipulated variables and responding variables

[1 mark]
[Making conclusion]

Source: Science Process Skills Form 1 Sasbadi

A3: UASA
Section A (5 marks)

1. Diagram shows a group of students doing exercise.

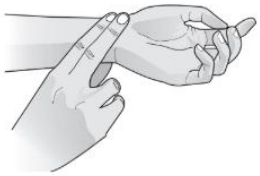


What happens to their body temperature after exercise?

A Increases
B Decrease
C Remains the same
D Continues to increase

[Understanding]

2. Diagram shows an activity of pulse counting which carried out by Abu.



Which statement is true regarding the pulse count?

A The pulse count increases when Abu rests.
B The pulse count increases when Abu falls asleep.
C The pulse count increases when Abu drinks water.
D The pulse count increases when Abu hears the bad news.

[Understanding]

3. Diagram shows a boy sitting under the hot sun.



Which statement is true about the corrective mechanism that takes place in the boy's body?

I. Hairs lie flat
II. Urine increases
III. Blood vessels constrict
IV. Body temperature decreases after sweating

A I and II
B III and IV
C II and III
D I and IV

[Understanding]

4. Why does a dog stick out its tongue during hot weather?

A To overcome thirst
B To get more fresh air
C To increase body temperature
D To decrease body temperature

[Remembering]

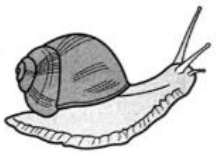
5. What is the body system that involved in the regulation of body temperature?

A Skeletal system
B Digestive system
C Endocrine system
D Respiratory system

[Understanding]

Section B
(20 marks)

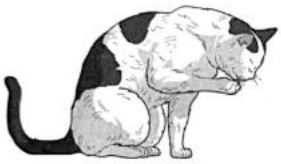
1. a) Mark (√) the correct responses of animals towards changes in surrounding temperature.

i. 

Look for dry places to reduce water loss. ☐

iii. 

Movement becomes faster in cold surrounding. ☐

ii. 

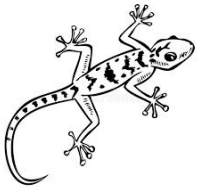
Lick fur to reduce the body temperature. ☐

iv. 

Stick out the tongue so that the temperature decreases. ☐

[2 marks]
[Remembering]

b) Diagram shows an organism regulates its body temperature when the surrounding temperature changes.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) The movement becomes slow in cold weather.	
ii) The metabolisme rate increases in hot surrounding.	
iii) The heartbeat faster in cold weather.	

[2 marks]
[Understanding]

2. a) Fill in the blanks using the given word options for the homeostasis in reptiles.

Low	Decreases	Increases

i. In a cold surrounding, body activities of reptiles such as movement and muscle function become slower. The metabolism rate _____.

ii. The body temperature _____. Homeostasis occurs in reverse in a hot surrounding.

[2 marks]
[Remembering]

b) Diagram shows the condition of a boy during cold weather.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) The blood vessels under the skin constrict.	
ii) A little urine is produced.	
iii) Hair lies flat to reduce air trapped on the skin.	

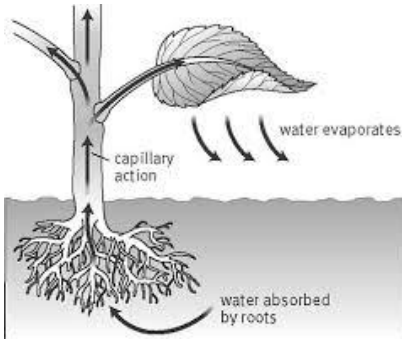
[2 marks]

3. a) Underline the correct answers about the stomata. [Understanding]

i. The stomata are (open / close) during the day to release excessive water from the leaves through transpiration.
ii. During hot weather, stomata is closed to reduce the (water / air) loss.

[2 marks]
[Remembering]

b) Diagram shows a process carried out by a plant.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i. Water loss from plants through the leaves is known as transpiration.	
ii. Transpiration from the leaves cools down the plant during cold days.	
iii. Transpiration helps plants to absorb and carry water and minerals from the soil to all parts of the plants.	

[2 marks]
[Understanding]

4. a) Match the correct answer.

i) Opened stoma

ii) Closed stoma

When the temperature is too high to reduce evaporation of water

When there are three guard cells

During the day to allow more water to evaporate

[2 marks]
[Remembering]

b) Circle any the correct statements about the condition of skin layer during high temperature.

W	Erect hairs trap a layer of air that acts as a heat insulator.
X	Sweat glands produce more sweat to cool the skin when sweat is evaporated.
Y	Blood vessels dilate to let more blood flow close to the skin to increase heat loss.
Z	Blood vessels constrict to let more blood flow away from the skin to reduce heat loss.

[2 marks]
[Understanding]

5. a) Match each biological response with its effects.

Biological response	Effect
i. Sweating	Body temperature increases
ii. Shivering	Increase in pulse rate
	Body temperature decreases

[2 marks]

[Remembering]

b) Diagram shows a boy having a high fever.



Mark **(√)** for the correct statements.

Statements	Mark (√)
i. Homeostasis provide the optimum conditions in the body.	
ii. Homeostasis is importance to carry out metabolism activities efficiently.	
iii. Changes in the temperature will not influence the enzymes activities.	

[2 marks]

[Understanding]

Section C
(8 marks)

1. Amir carried out an experiment to study the effect of physical activity on the rate of pulse. The table shows the pulse reading which is obtained after completing three different physical activities.

Typse of activity	Rate of pulse (bpm)
Resting	**80**
Walking	**115**
Running	**165**



a) State one observation based on the information given in the table.

_____

[1 mark]
[Observing]

b) State the inference based on the observation in (a).

_____

[1 mark]
[Making inference]

c) Identify the variables for the experiment.

(i) Manipulated variable: _____

(ii) Responding variable: _____

(iii) Constant variable : _____

[3 marks]
[Controlling the variables]

d) State one precautionary step that need to be taken when conducting this experiment.

_____

[1 mark]
[Experimenting]

e) State the operational definition for the pulse rate towards the type of activities.

_____

[1 mark]
[Defining operationally]

f) State the conclusion for this experiment.

_____

[1 mark]
[Making conclusion]

A4: Assessment

1 . State the importance of homeostasis to humans and living things.

_____

_____

[2 marks]
[Remembering]

2. Read the passage below.

The bee's loss water through its spiracles

a) How does the bees overcome this problem?

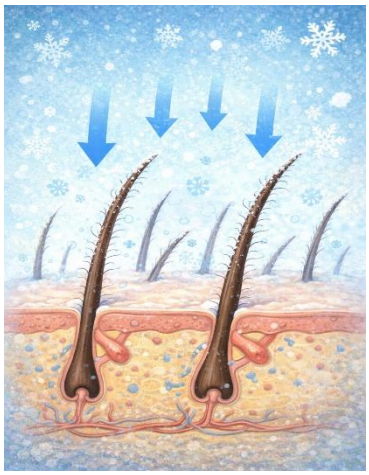
_____

b) Other than the method in (a), how does the bees reduce the water loss?

_____

[2 marks]
[Applying]

3. Diagram shows the hair during lower surrounding temperature.



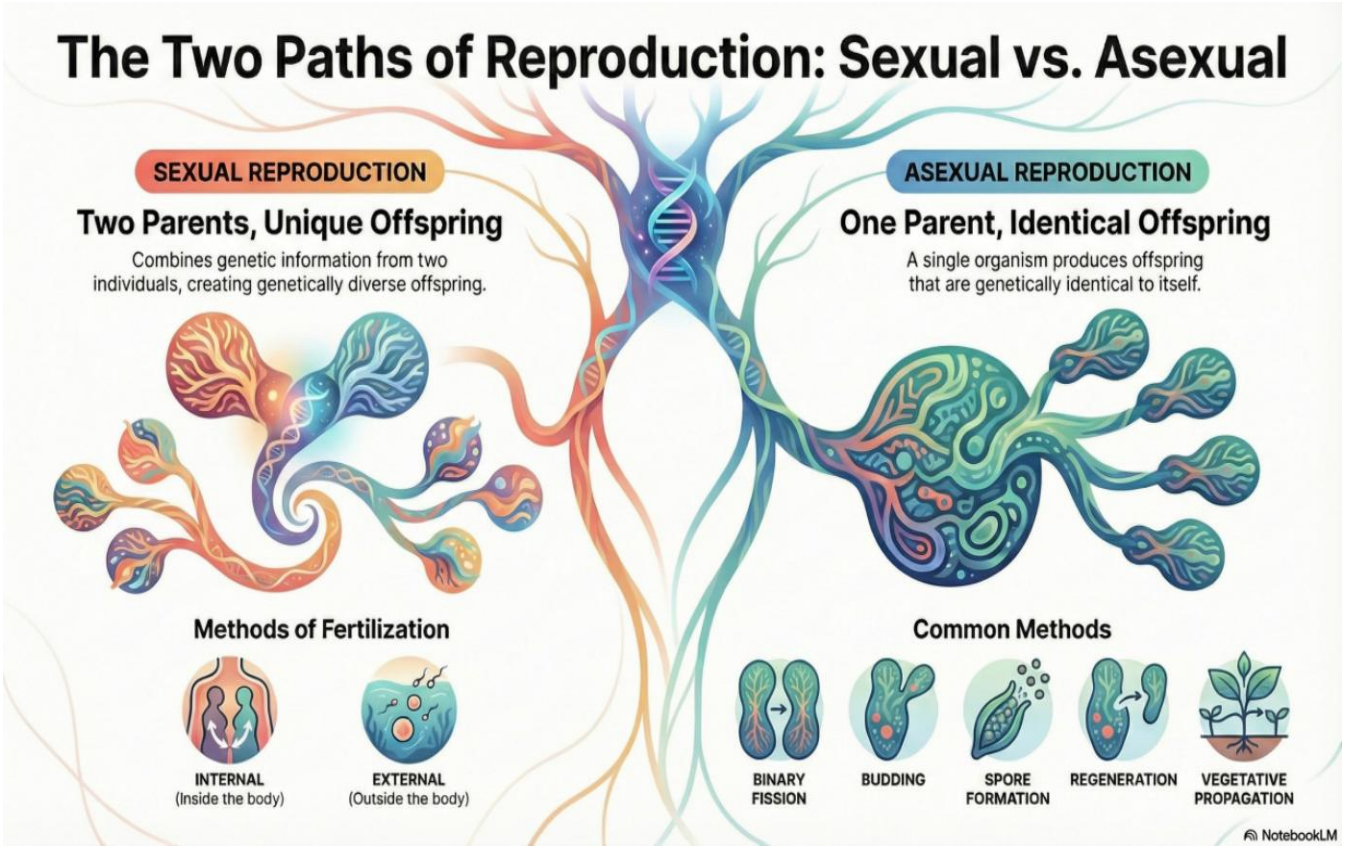
Complete the statements on the regulation of body temperature in cold weather.

The skeletal muscles contract and relax _____causing the body _____ . Hairs _____ erect. The blood vessel in the skin _____. Certain hormones are secreted and the body metabolism _____. Body temperature _____ .

[6 marks]
[Remembering]

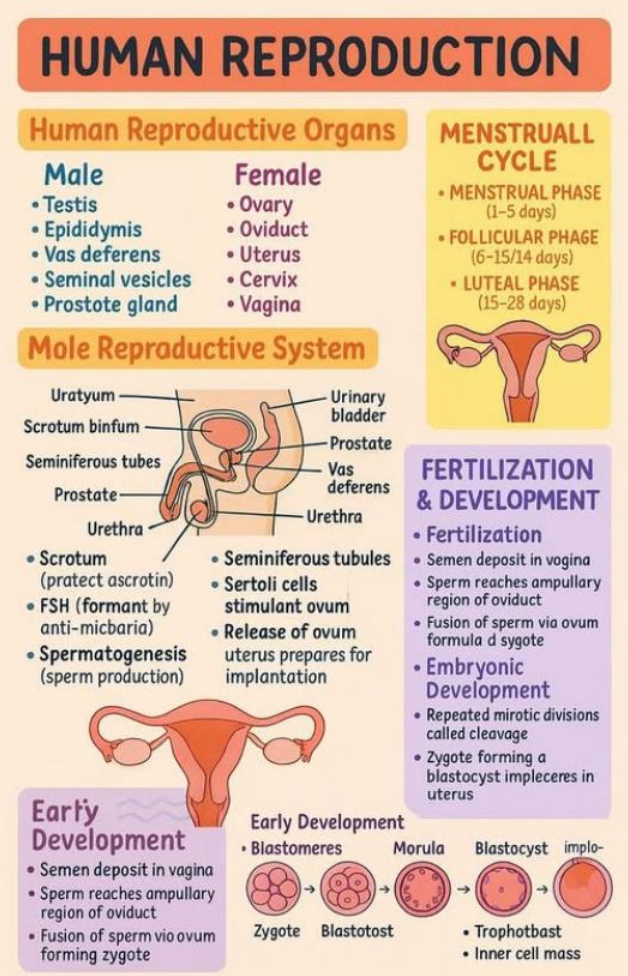
Session 5	
Learning Area	4.0 Reproduction
Content Standard	4.1 Sexual and asexual reproduction 4.2 Human reproductive system 4.3 Menstrual cycle
Learning Objective	Students will be able to accomplish the tasks regarding the types and methods of sexual and asexual reproduction in animals and plants, structures and function of the male and female reproductive systems and communicate about menstrual cycle.
Learning Focus	(1) sexual and asexual reproduction in animals and plants (2) structures and function of the male and female reproductive systems (3) menstrual cycle
Teaching Aids	(1) Smart Learning Notes. (Refer to A1) (2) UASA-format items Enhancement Exercises (Refer to A2) (3) Assessment (Refer to A3) (4) Answer scheme (Refer to A4)

A1: Smart Learning Notes

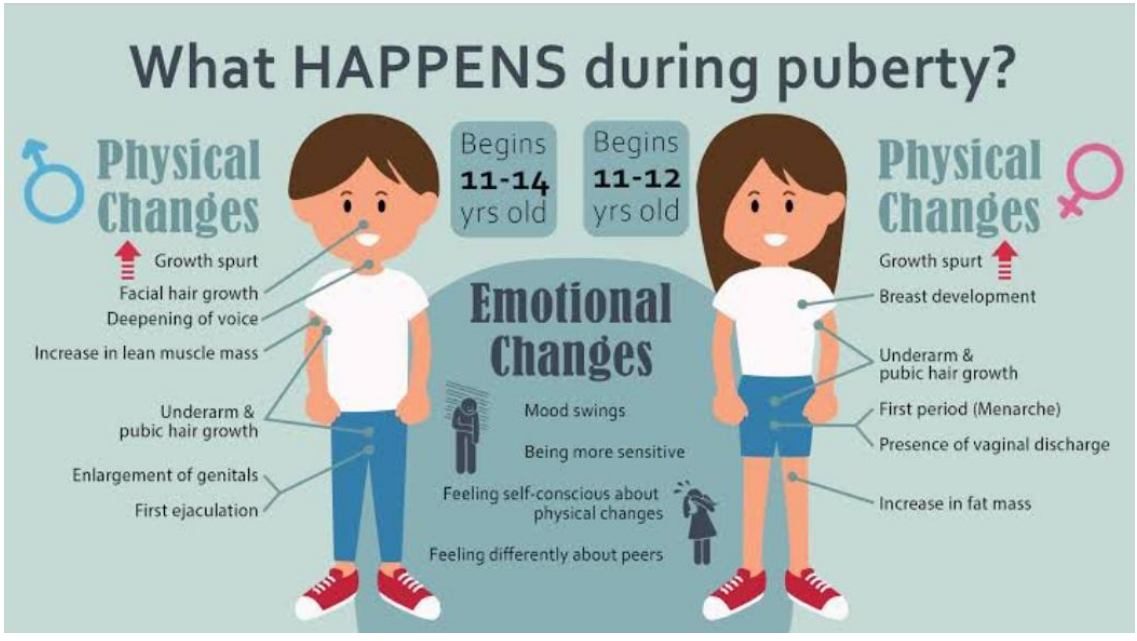


Sumber: notebooklm

A1: Smart Learning Notes







Sumber : Https://www.sciencefacts.net

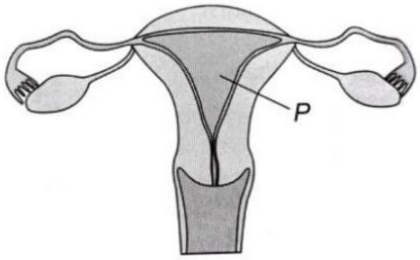
A2: UASA-format items Enhancement Exercises

Section A
(5 marks)

1. What is the importance of reproduction?

   A Cause extinction
   B Reduce variation
   C Decrease the number of species
   D Increase the number of individuals of the same species [Remembering]

2. Diagram shows the female reproductive system.



   What is the function of part P?

   A Receives sperms
   B Produces female gametes
   C The place of fertilisation of sperm and ovum
   D The place where the embryo develops and grows [Understanding]

3. Diagram shows a method of asexual reproduction in an unicellular organism.



   What is the method of this asexual reproduction?

   A Budding
   B Conjugation
   C Regenaration
   D Binary fission [Understanding]

4. The menstrual cycle consists of four phases that last about 28 days.
In which phase does the ovulation occur?

A Fertile phase
B Repair phase
C Menstrual phase
D Premenstrual phase [Remembering]

5. Aisyah experienced the first day of menstruation on January 24, if her menstrual cycle is regular, when will her next month menstrual cycle start?

A February 10
B February 19
C February 20
D February 24 [Applying]

Section B
(20 marks)

1. (a) Fill in the blanks about the female reproductive system with the given words.

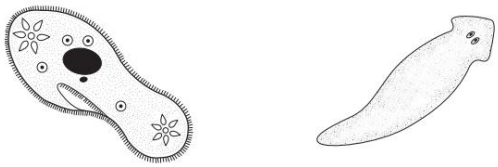
uterus	cervix	Fallopian tube

(i) _____ produces mucus for the sperms to move into the uterus.

(ii) _____ implants and protects the embryo.

[2 marks]
[Remembering]

(b) Diagram shows two organisms.



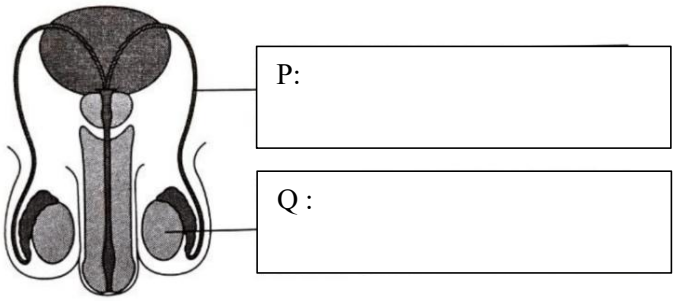
Mark (✓) the correct statements about reproduction of both organisms.

(i) Involve one parent.	
(ii) Does not involve gamete.	
(iii) Carry out external fertilisation.	

[2 marks]
[Understanding]

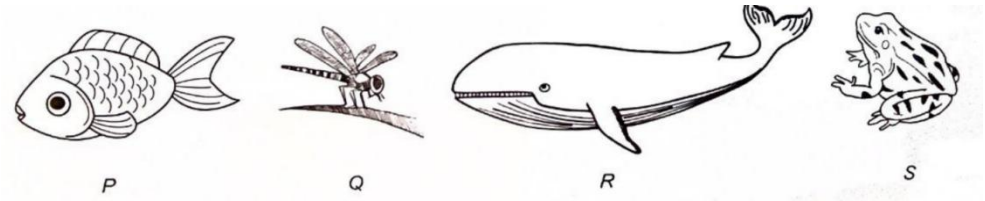
2 (a) Label parts P and Q of the male reproductive system by using the following words.

Seminal vesicle	Testis	Sperm duct



[2 marks]
[Remembering]

(b) Diagram shows several types of animals.

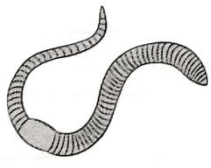
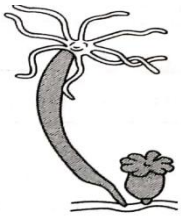
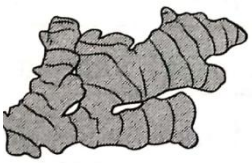


Mark (✓) the correct statements of the same characteristics of reproduction of both organisms.

Statements	**Mark (✓)**
(i) All the animals P, Q, R and S lay eggs.	
(ii) Animals R and S breathe through lungs.	
(iii) Animals P, R and S are vertebrates.	

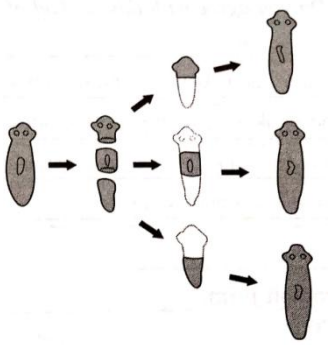
[2 marks]
[Understanding]

3. (a) Circle the organisms that carry out asexual reproduction.

(i)	(ii)	(iii)
		

[2 marks]
[Remembering]

(b) Diagram shows a type of reproduction.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statements	TRUE or FALSE
i	This type of reproduction requires two parent organisms.	
ii	The offspring produced are genetically identical to the parent.	
iii	This type of reproduction involves the growth of a new organism from a body part.	

[2 marks]

[Understanding]

4 (a) Underline the correct answers for the statements below.

(i) Fertilisation between sperm and ovum occurs at the (uterus, Fallopian tube).

(ii) (Seminal vesicle, sperm duct) secretes fluid containing nutrients for sperms.

[2 marks]

[Remembering]

(b) Diagram shows a type of reproductive cell.



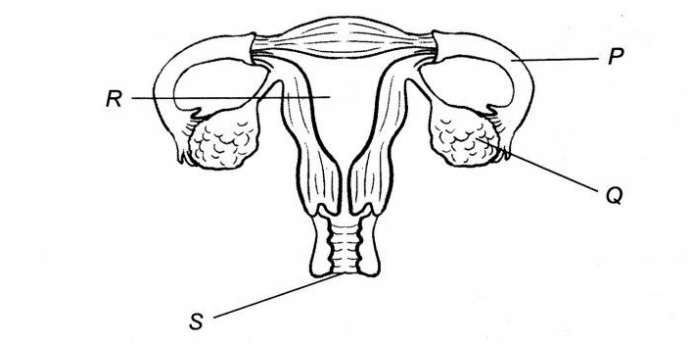
Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
(i) The smallest cell in the male body.	
(ii) The cell is produced by the prostate gland.	
(iii) It can live up to five days.	

[2 marks]

[Understanding]

5 (a) Diagram shows the female reproduction system.



Labelled the structure of P and Q with the given words.

Ovary	Uterus	Fallopian tube

P : _____ Q : _____

[2 marks]
[Remembering]

(b) Diagram shows a type of reproductive cell.



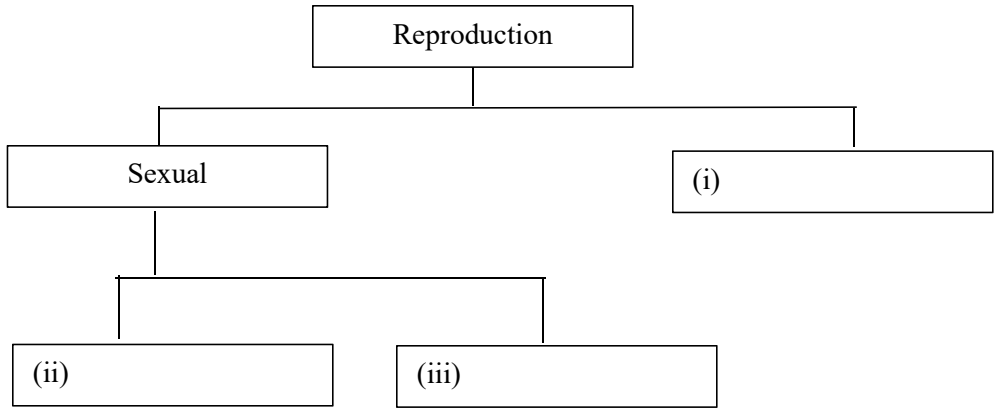
Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE or FALSE**
(i) The biggest cell in the female body.	
(ii) The cell is produced in the ovary.	
(iii) It can live up to a week.	

[2 marks]
[Understanding]

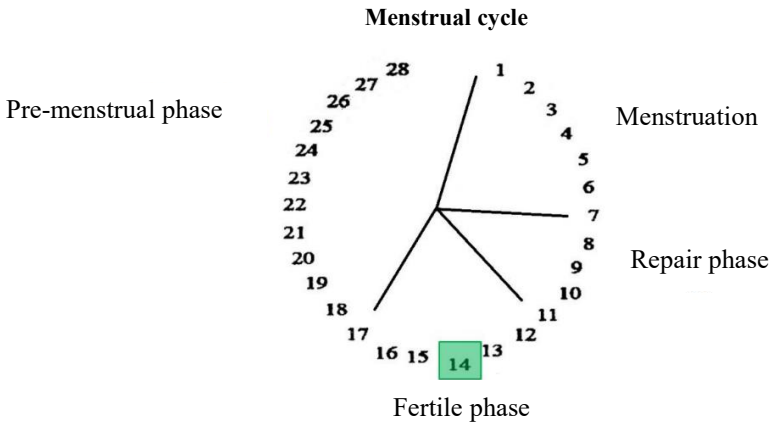
Section C
(8 marks)

1 (a) Complete the following chart about the types of reproduction.



[3 marks]
[Remembering]

(b) Diagram shows the phase changes in the menstrual cycle of a woman.



(i) State one substance discharged during the Menstruation phase.

_____

[1 mark]
[Remembering]

(ii) State a good practice of personal hygiene during Menstruation phase. Justify the importance of the practice.

Good practice: _____

Justification: _____

[2 marks]
[understanding]

(iii) Compare and contrast between pre-menstrual phase and menstruation phase.

Similarity: _____

Difference: _____

[2 marks]
[Analysing]

A4: Assessment

Answer all questions.

1. (a) _____ reproduction involves the fusion of a male gamete and a female gamete.

(b) _____ reproduction only involves one individual organism.

[2 marks]

2. State the method of asexual reproduction in the following organisms.

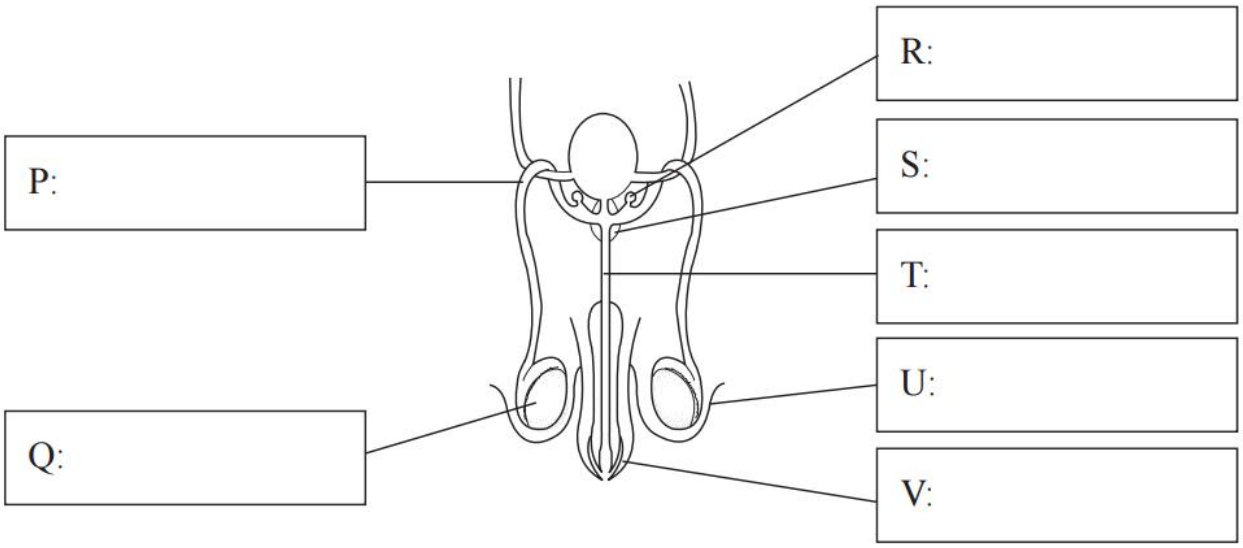
(a) Yeast: _____ (c) Bacteria: _____

(b) Amoeba :_____ (d) Mucor : _____

[4 marks]

3.Label the male reproductive system using the words given.

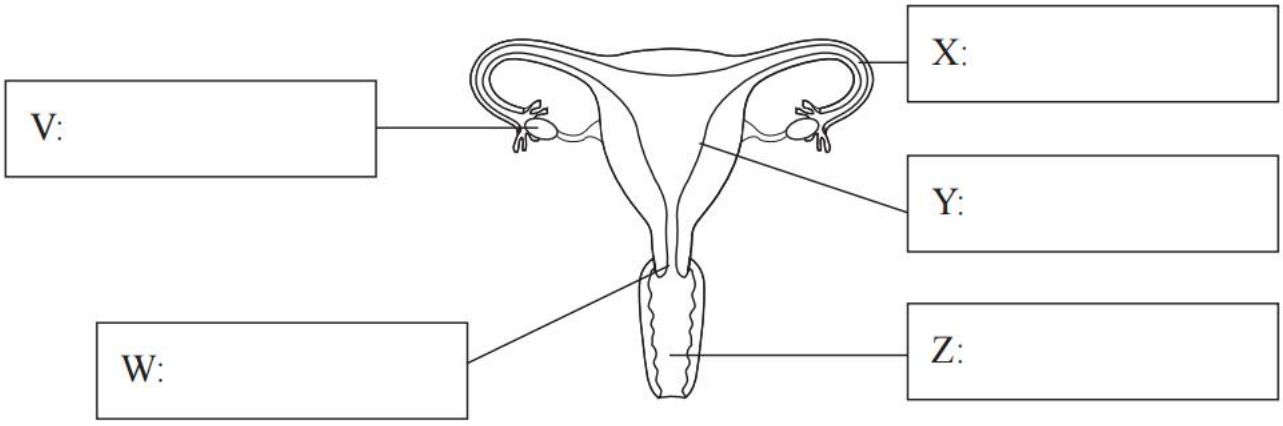
Urethra, Penis , Prostate gland, Scrotum, Testis, Sperm duct, Seminal vesicle



[7 marks]

4. Label the female reproductive organs below by using the words given.

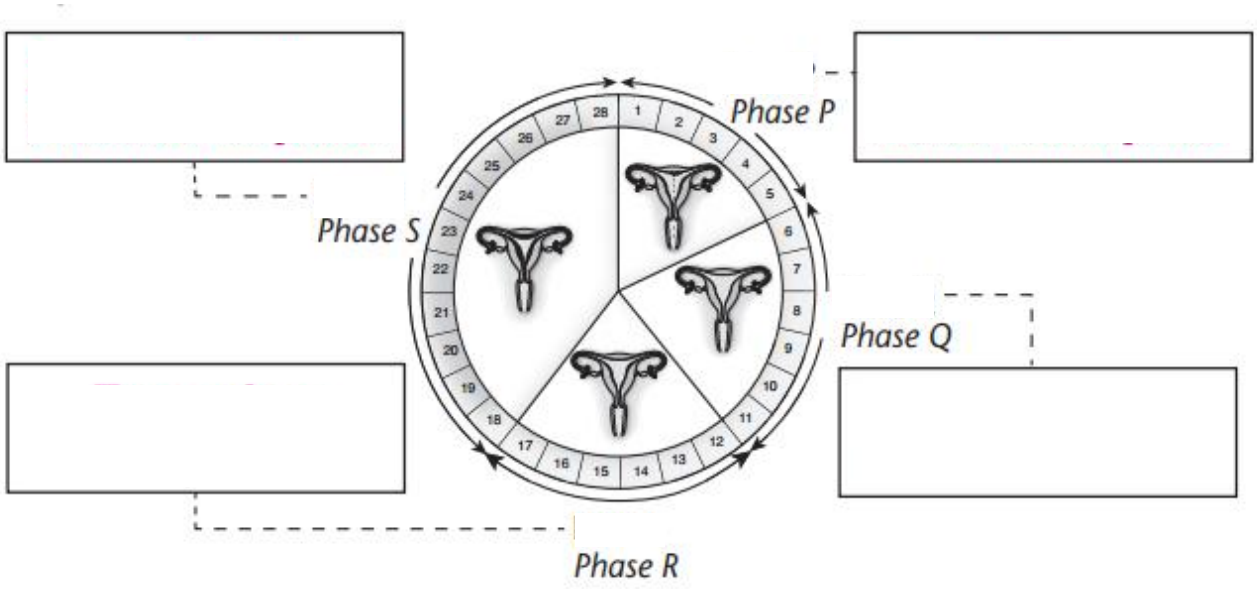
Cervix , Vagina, Uterus, Fallopian tube , Ovary



[5 marks]

5. Label the phases P, Q, R and S using the words below.

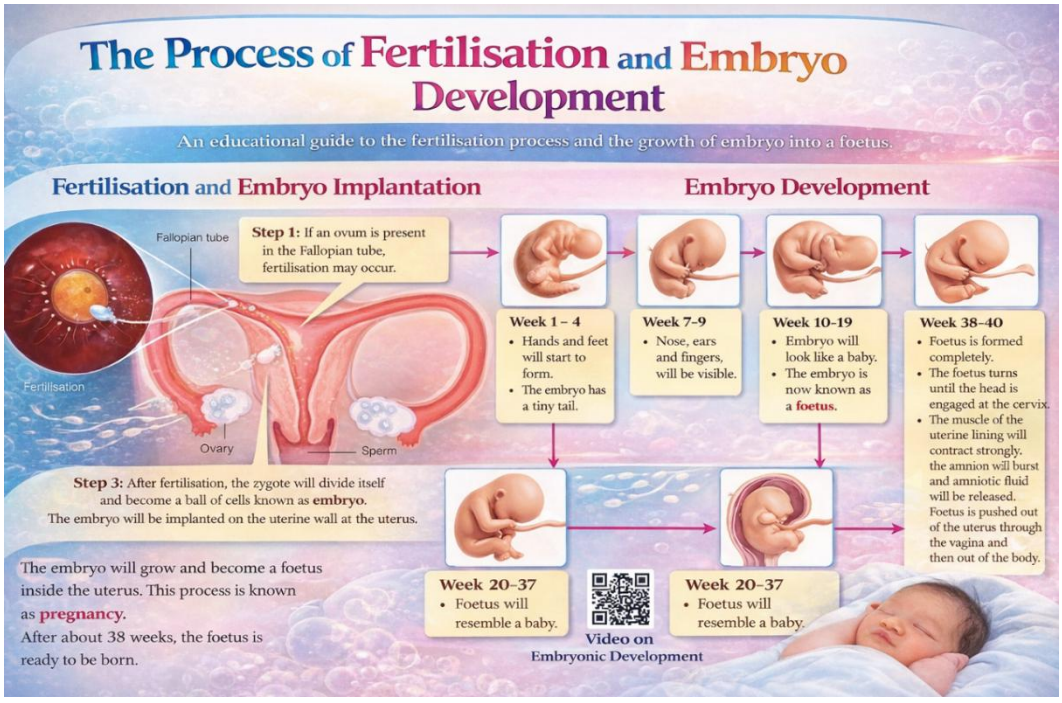
Repair phase	Fertile phase	Premenstrual phase	Menstruation phase



[4 marks]

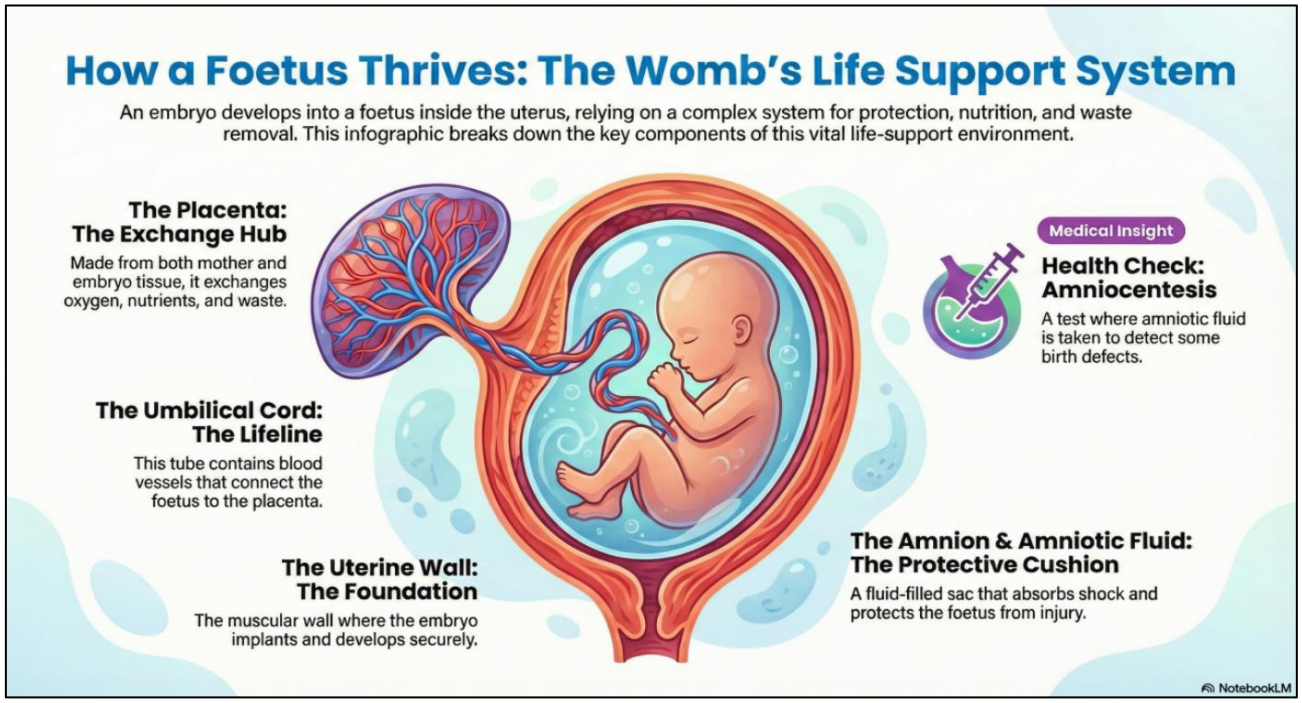
Session 6	
Learning Area	4.0 Reproduction
Content Standard	4.4 Fertilisation and pregnancy 4.5 Factors affecting the development of a foetus and baby 4.6 Infertility and contraception
Learning Objective	Students will be able to accomplish the tasks regarding the 1. process of fertilisation and the implantation of embryo, 2. the importance and functions of placenta and umbilical cord, 3. development of a zygote into an embryo and subsequently into a foetus during pregnancy until birth. 4. importance of avoiding the intake of harmful substances to the foetus 5. Male and female infertility, methods of contraception
Learning Focus	1. process of fertilisation and the implantation of embryo, 2. the importance and functions of placenta and umbilical cord, 3. development of a zygote into an embryo and subsequently into a foetus during pregnancy until birth. 4. importance of avoiding the intake of harmful substances to the foetus 5. male and female infertility, methods of contraception
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) 3. Assessment (Refer to A3) 4. Answer scheme (Refer to A4)

A1: Smart Learning Notes

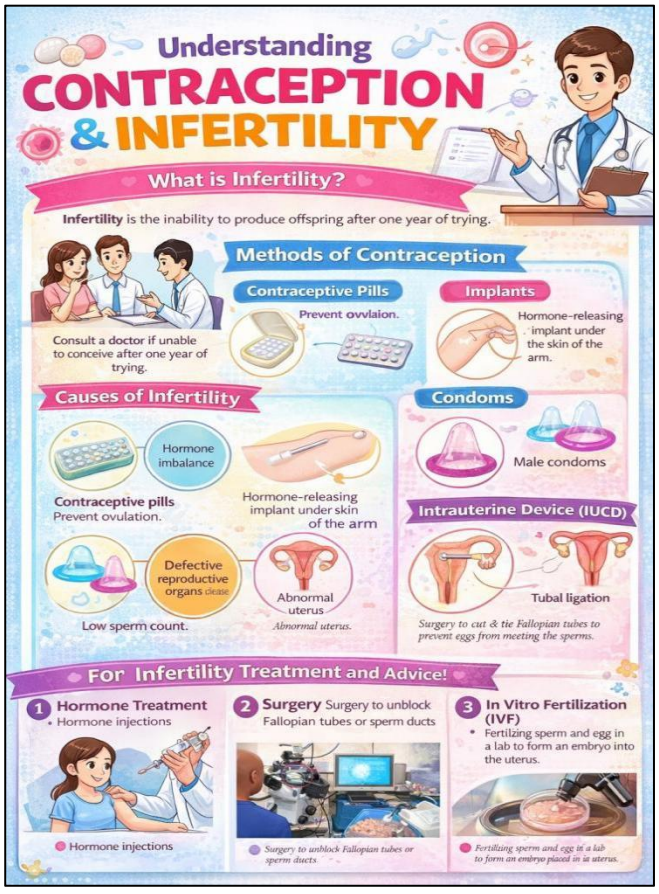


Sumber: chatgpt Ai

A1: Smart Learning Notes







Sumber: chatgpt Ai

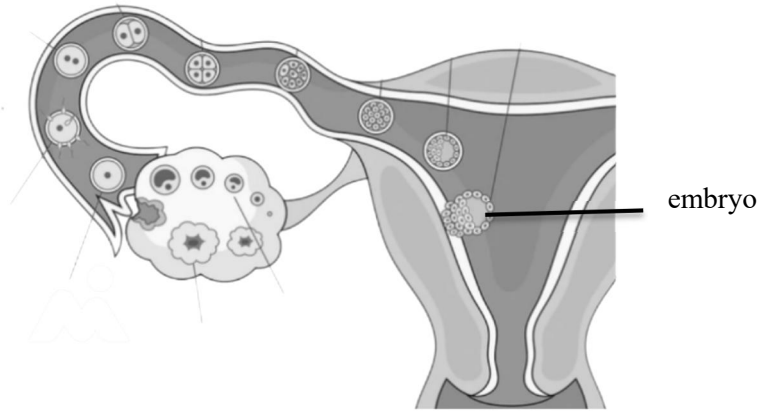
A2: UASA-format items Enhancement Exercises

Section A
(5 marks)

1. Where does fertilisation occur in the female reproductive system?

   A Ovary
   B Uterus
   C Vagina
   D Fallopian tube [Remembering]

2. Diagram shows the embryo implanted on the uterine wall.



   Why is the embryo implanted in the uterine wall after fertilisation?

   A To shorten the pregnancy period
   B To enable the embryo to obtain hormone
   C To obtain nutrients and oxygen for growth
   D To allow the embryo to move to the ovary [Understanding]

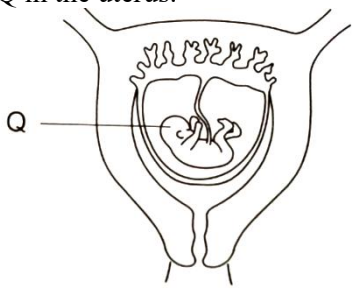
3. Which of the following is the primary function of the amniotic fluid?

   A To produce hormones that maintain pregnancy.
   B To protect the fetus by acting as a shock absorber.
   C To transport oxygen from the mother to the fetus.
   D To provide the fetus with essential nutrients like glucose. [Remembering]

4. A married couple wants to delay pregnancy. The wife cannot take hormonal pills due to health reasons. Which contraceptive method is most suitable to prevent pregnancy by preventing implantation?

   A Condom
   B Vasectomy
   C Contraceptive implant
   D Intrauterine Contraceptive Device (IUCD) [Application]

5. Diagram shows the development of Q in the uterus.



Which of the mother's habits is harmful to Q?

A Take iron pills
B Eat more fruits
C Exercise regularly
D Drink alcoholic beverages

[Understanding]

Section B
(20 marks)

1 (a) Fill in the blanks with the words given.

reproduction	implantation	embryo

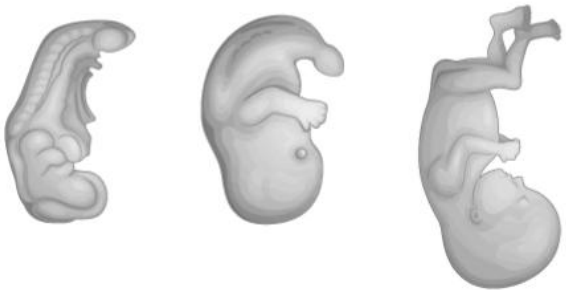
(i) The process where the embryo attaches to the wall of the uterus is called _____.

(ii) After fertilisation, the zygote divides into a ball of cells known as an _____.

[2 marks]

[Remembering]

(b) Diagram shows the stages of human development.



Week 1-4 Week 7-9 Week 10-19

Mark (√) for the correct statements.

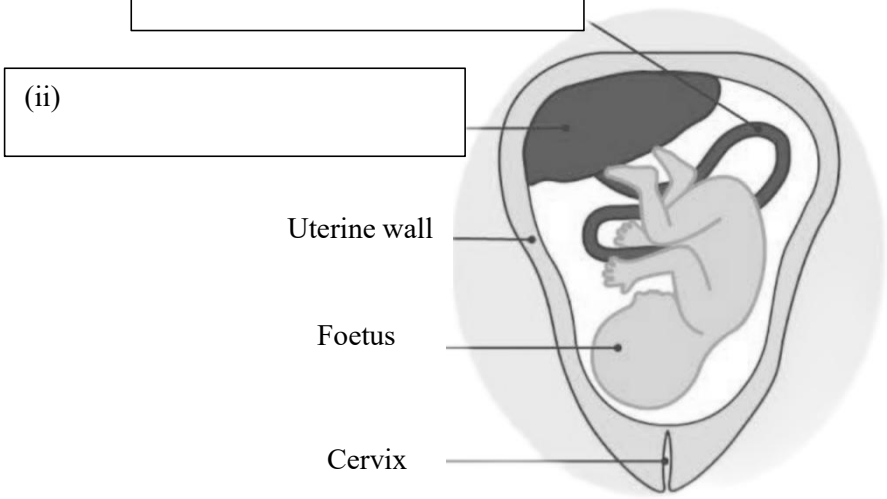
Statements	Mark (√)
(i) In week 1–4, hands and feet will start to form	
(ii) In week 7–9, the embryo has a tiny tail	
(iii) In week 10–19, the embryo is now known as a foetus	

[2 marks]

[Understanding]

2. (a) Diagram shows a foetus in a mother's womb.
Label the diagram by using the following words.

Uterine wall	Placenta	Umbilical cord



[2 marks]
[Remembering]

(b) Based on the diagram above, write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE or FALSE**
(i) The mother's blood and the fetus's blood mix directly within the placenta.	
(ii) The umbilical cord contains blood vessels that carry nutrients and waste products.	
(iii) The placenta acts as a barrier that prevents all harmful substances and viruses from reaching the fetus.	

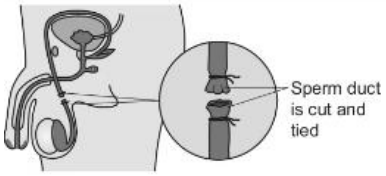
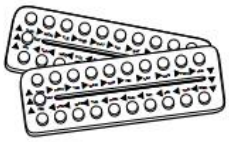
[2 marks]
[Understanding]

3 (a) Write **Male** or **Female**, for the following factors of sterility.

Factors of sterility	**MALE or FEMALE**
i. Blocked Fallopian tube	
ii. Low sperm count	
iii. Impotent	

[2 marks]
[Remembering]

(b) Mark (√) for the correct statements about the contraceptive devices with the correct functions.

Contraceptive devices	Function of devices	Mark (√)
(i) 	Prevent the fertilised ovum from implanting to the ovary	
(ii) 	Prevents the sperms from being transported to the urethra	
(iii) 	Prevent ovulation	

[2 marks]

[Understanding]

4. (a) Fill in the blanks with the words given.

iron	calcium	alcohol

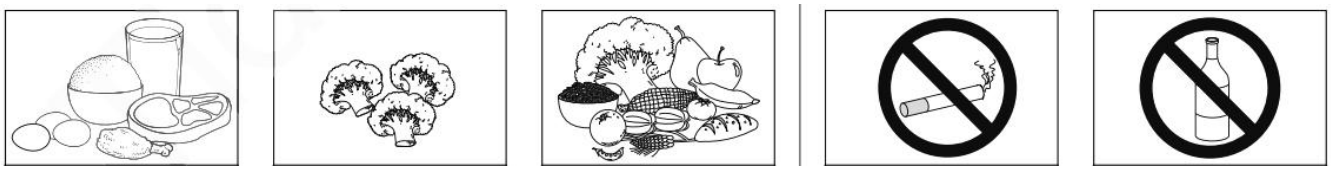
(i) To support the formation of strong bones and teeth in the foetus, a mother's diet should be rich in _____ and Vitamin D.

(ii) The intake of _____ during pregnancy is strictly discouraged as it can lead to Foetal Alcohol Syndrome (FAS).

[2 marks]

[Remembering]

(b) Diagram shows some nutrients should be taken and bad habits to be avoided by a pregnant woman.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

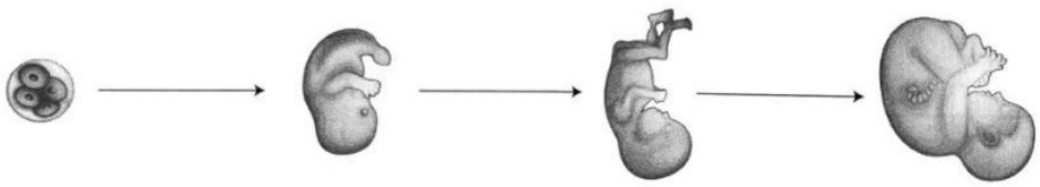
Statements	**TRUE** or **FALSE**
i. A pregnant woman requires a higher intake of folic acid primarily to prevent neural tube defects in the developing foetus.	
ii. Formula milk contains the same level of natural antibodies as breast milk, providing identical immune protection for the infant.	
iii. Pregnant woman have to avoid smoking because it will harm her health and the baby.	

[2 marks]

[Understanding]

5. (a) Complete the following flow map about the human development process.

Foetus	Embryo	Zygote



Zygote	→	(ii)	→	(iii)	→	Baby

[2 marks]

[Remenbering]

(b) Diagram shows a foetus in the mother's uterus.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

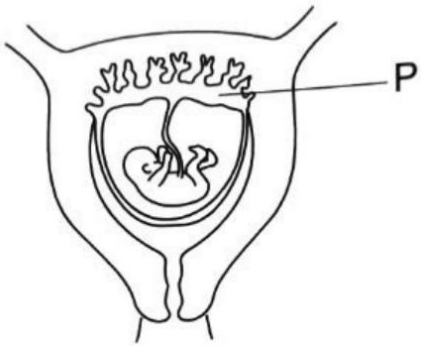
Statements	**TRUE or FALSE**
(i) Umbilical cord eliminate waste materials from the embryo to the mother.	
(ii) Umbilical cord transport oxygen and nutrients from the mother to the embryo.	
(iii) Placenta protect embryo from concussions.	

[2 marks]

[Understanding]

Section C
(10 marks)

1 (a) Diagram shows a foetus in the mother's womb. **P** is a structure that attaches the foetus to the wall of the uterus.



(i) State the **P**.

_____

[1 mark]
[Remembering]

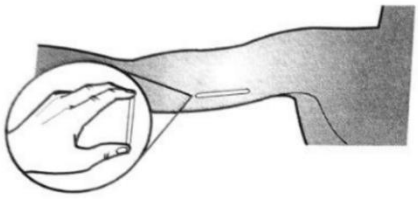
(ii) State **two** functions of **P**.

Function 1: _____

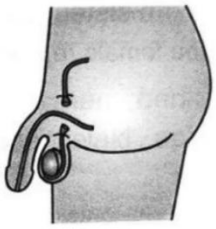
Function 2: _____

[2 marks]
[Understanding]

(b) Diagram shows two methods of contraception, Q and R for married couples.



Q



R

(i) State the methods Q and R.

Q : _____

R : _____

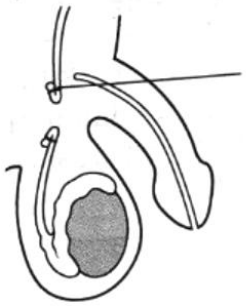
[2 marks]
[Remembering]

(ii) State **two** differences between methods Q and R.
Difference 1 : _____

Difference 2 : _____

[2 marks]
[Analysing]

(c) A newly-wed couple plans to choose contraception method as shown in the diagram below.



As their best friend, do you agree with their planning? Explain your answer.

_____

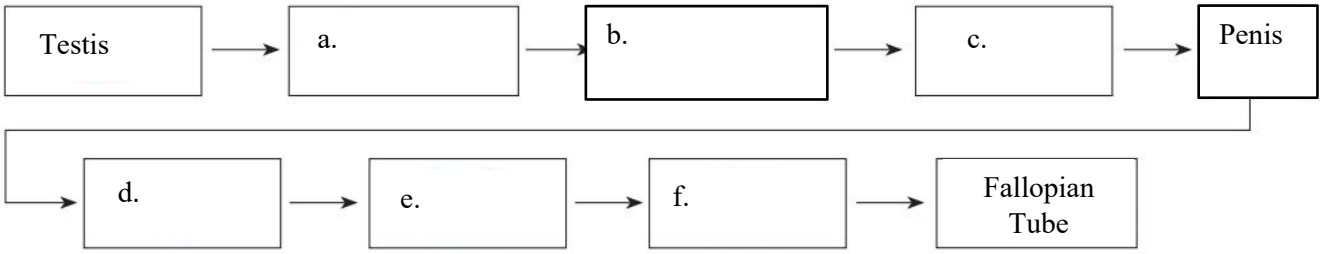
_____

_____

[3 marks]
[Evaluating]

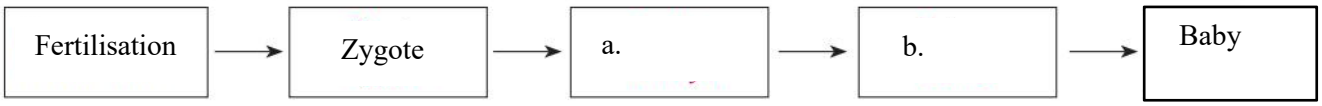
A4: Assessment

1. Complete the flow map to show the movement of the sperms from the male body to the Fallopian tube.



[6 marks]

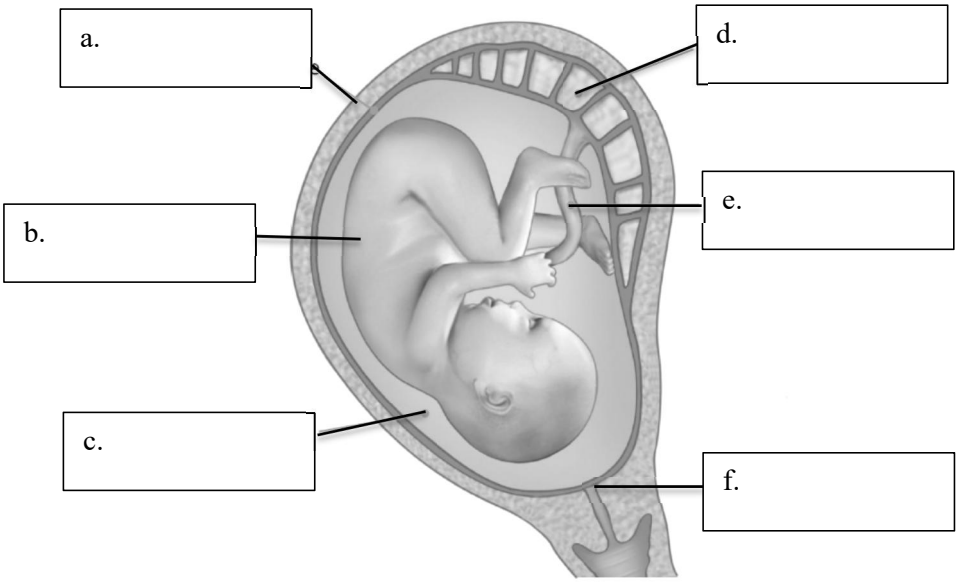
2. Complete the flow map to show the development of a zygote into a baby.



[2 marks]

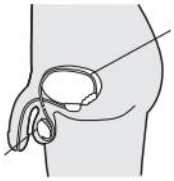
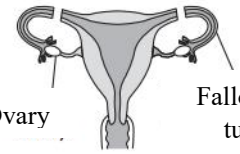
3. Diagram shows the structures in the mother's uterus. Fill in the boxes using words given.

Foetus	Amniotic fluid	Umbilical cord	Placenta	Cervix	Uterus



[6 marks]

4. Based on the diagrams, state the devices or the methods of contraception.

(a) 	(b) 	(c) 
(d) 	(e) 	(f) 

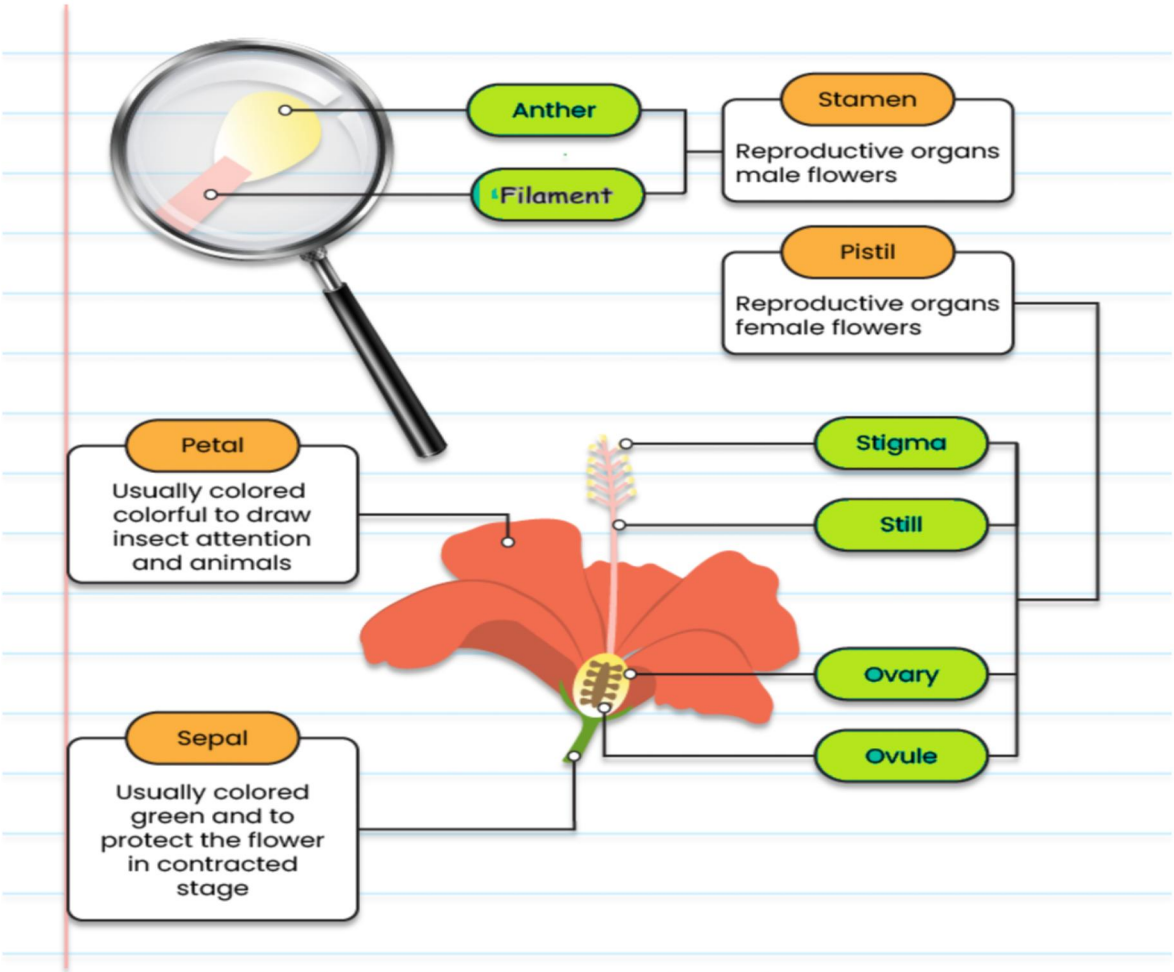
[6 marks]

Session 7	
Learning Area	4.0 REPRODUCTION
Content Standard	4.7 Plant Reproduction
Learning Objective	Students will be able to accomplish tasks related to the types of plant reproduction, the structure and functions of reproductive parts of flowering plants, the types of pollination and the importance of pollination and fertilisation in producing new plants.
Learning Focus	1. Parts of a flower and their functions. 2. Process and types of pollination and its type. 3. Fertilisation and how seeds and fruits are formed in flowering plants after pollination. 4. Germination process of a seed and what happens as the seed begins to grow.
Teaching Aids	1. Smart Learning Notes (refer to A1) 2. Technique of answering (refer to A2) 3. UASA-format items Enhancement Exercises (refer to A3) • Fact/knowledge (content) • Science process skill 4. Assessment (refer to A4) 5. Answer scheme (Refer to A5)

A1: Smart Learning Notes

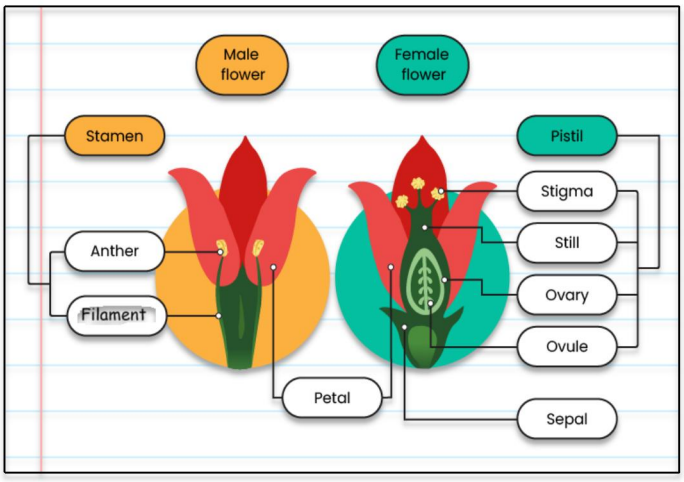
4.7 Plant Reproduction

Structure and function of each part a flower

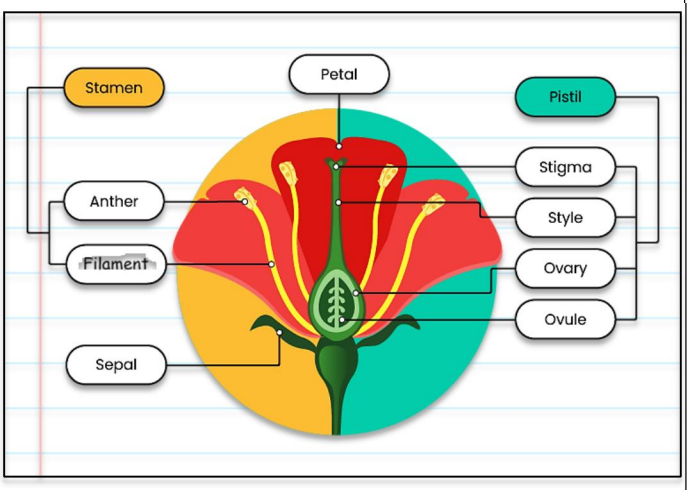


Pollination is the process by which pollen grains are transferred from the anther to the stigma.

There are two types of flowers, bisexual and unisexual flower.



Unisexual Flower, for example Corn Flower and Papaya Flower



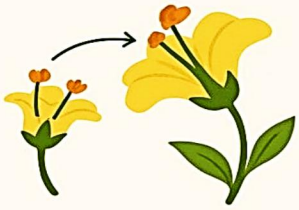
Bisexual Flower, for example rose and sunflower

Source: https://app.pandai.org/note/read/kssm-sc-07-04-07/KSSM-F1-SC-04-07

Types of pollination

SELF-POLLINATION VS CROSS-POLLINATION



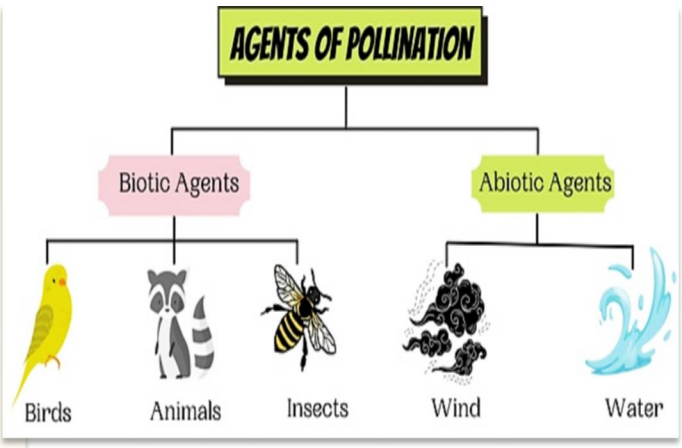


SELF-POLLINATION

- Pollen transfers from anther to stigma of the same flower or plant
- No external pollinators needed
- Low genetic variation
- Examples: Rice, Pea, Tomato

CROSS-POLLINATION

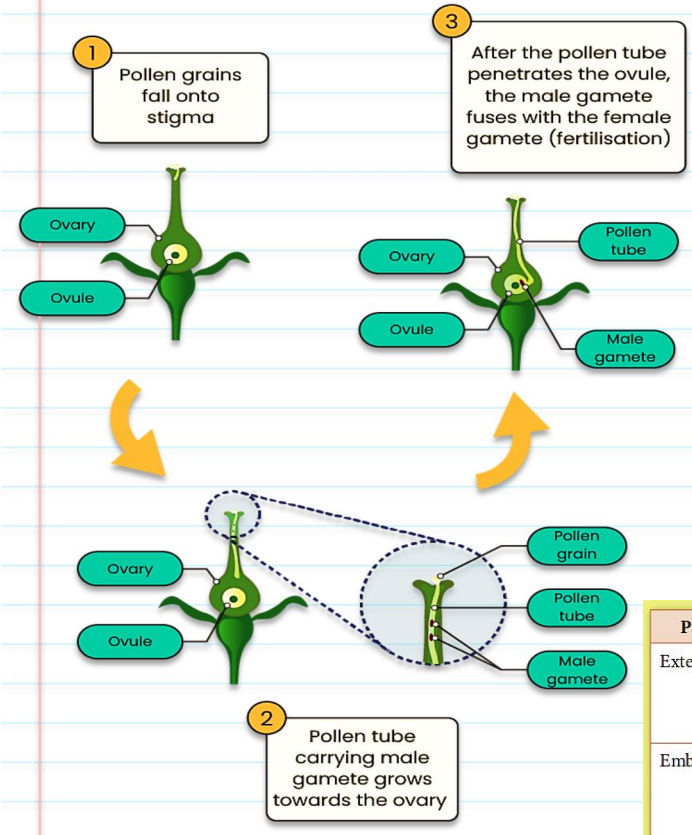
- Pollen transfers between different plants of the same species
- Requires agents like wind, insects, birds, etc.
- High genetic diversity
- Examples: Maize, Apple, Sunflower



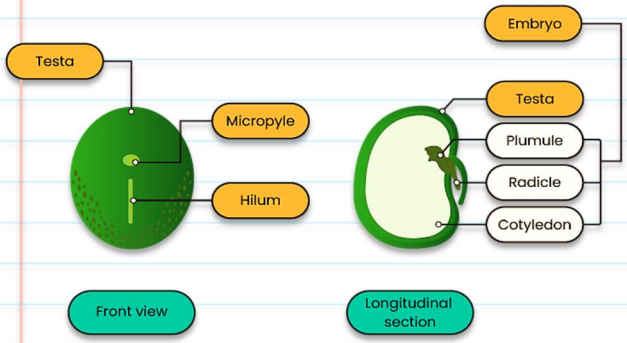
The Advantages of Cross-Pollination

- New plants that are more resistant to pests and diseases
- Healthier plants which can adapt better to changes in the environment
- New varieties of plants
- Good quality seeds

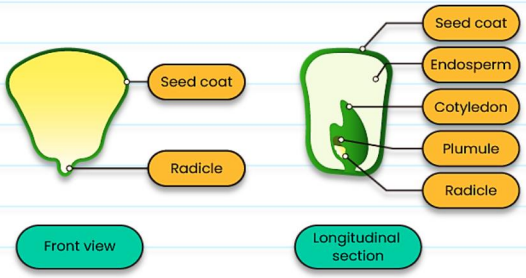
Fertilisation of male and female gametes in plant



Structures of a Seed and Their Functions



Structure of Dicotyledonous Seed

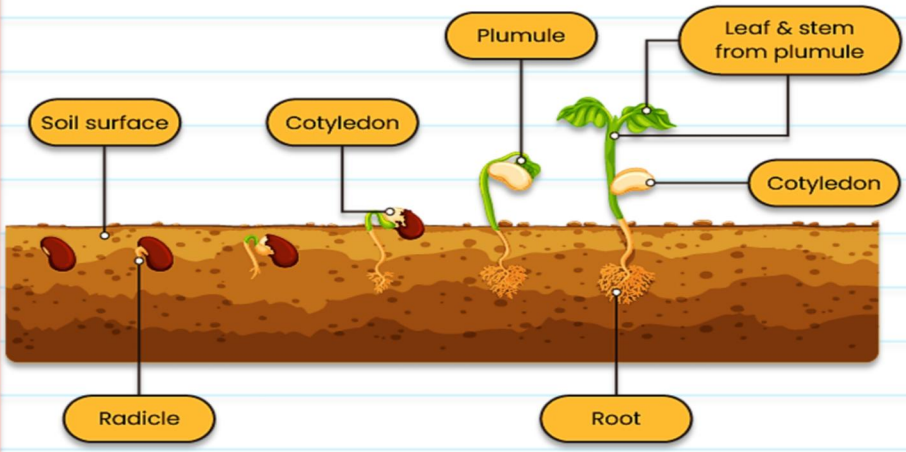


Structure of Monocotyledonous Seed

Part	Structure	Function
External	Testa	Protects the seed
	Hilum	Place where the seed sticks to the fruit
	Micropyle	Small hole to allow air and water to enter the seed
Embryo	Plumule	Part of the embryo which develops into a new shoot
	Radicle	Part of the embryo which develops into the root
	Cotyledon / Endosperm	Stores and provides food for the seed

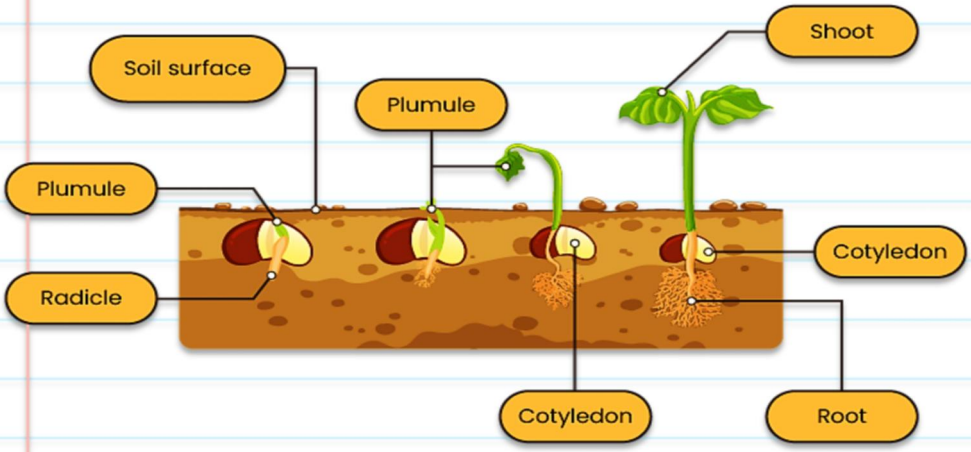
Source: https://app.pandai.org/note/read/kssm-sc-07-04-07/KSSM-F1-SC-04-07

Germination of Seeds



Epigeal germination

- During germination, the testa bursts and the radicle starts to appear and grow downwards into the soil to form root.
- Meanwhile, the plumule grows upwards to form a new shoot.
- Certain cotyledons are carried out of the soil and this is known as epigeal germination.



Hypogeal germination

- There are also cotyledons that remain in the soil during germination. This germination is known as hypogeal germination

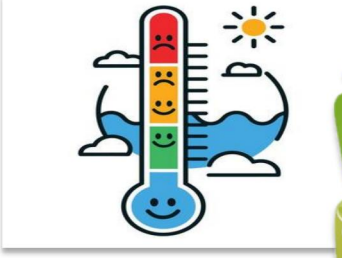
The Conditions Required for Germination of Seeds



Water



Air



Suitable temperature



Source: https://app.pandai.org/note/read/kssm-sc-07-04-07/KSSM-F1-SC-04-07

A2: Technique of Answering

Science Process Skills

Example:

1. Diagram shows two experimental set-ups prepared by a student to study water is required for germination of seed.



(a) Identify the variables for the experiment:

(i) Manipulated variable: Presence of water

(ii) Responding variable : Germination of seed

Manipulated variable
Aspect/factor that is purposely changed on apparatus
Responding variable
Aspect/factor that is observed and recorded
Constant variable
Aspect/factor that is unchanged/remained

[2 marks]
[Controlling variables]

(b) State observations for the seeds in Beaker A and Beaker B after 3 days.

Seeds in Beaker B germinate / produce plumule (soot) whereby seeds in Beaker A do not germinate / remain dry / no plumule.

What can be observed in the diagram after 3 days

[2 marks]
[Observing]

(c) Suggest a hypothesis for this experiment.

Seeds will germinate with the presence of water.

Manipulated variable + Responding variable

[1 mark]
[Making hypothesis]

(d) Based on the results, what inference can be made about the role of water in germination?

Water is needed/necessary for seed germination. Water activates enzymes / softens testa / allows embryo to grow.

Interpreting data + Explain based on the data

[2 marks]
[Interpreting Data / Making Inference]

(e) Predict what happens if Beaker B is kept for 7 days.

Seeds in beaker B continue growing (longer radicle/plumule).

Making a reasonable forecast based on given information

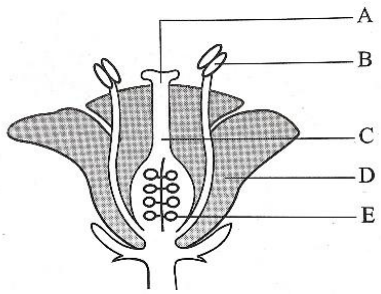
[1 mark]
[Predicting]

Sumber: https://chatgpt.com/c/69835a44-b1e8-839e-8aae-1e18f0094f69

A3: UASA-format items Enhancement Exercises

Section A
(5 marks)

1. Diagram shows the cross section of a flower. [Remembering]



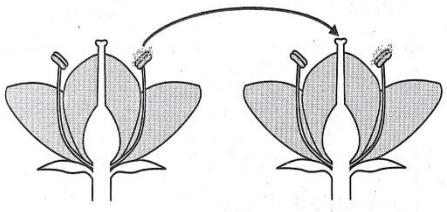
The female part of the flower is made up of the structures labelled:

A A, C and E
B B, C and E
C B, D and E
D A, C, D and E

2. Which of the following describes pollination? [Remembering]

A Male gamete enters the ovule.
B Pollen grains land on the stigma.
C Male gamete fuses with the female gamete.
D Pollen grains grow, the pollen tubes down the style.

3. Diagram shows a type of pollination.



The following are some of the benefits **except** [Understanding]

A Produces new varieties.
B Produces high quality seeds.
C Can adapt to the environment.
D Produces plants with low resistance to pest attacks.

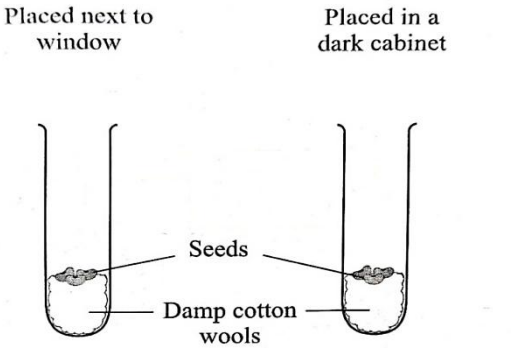
4. What are the characteristics of insects-pollinated flower? [Remembering]

I Smell nice
II Furry stigma
III Long filament
IV Sticky pollen grain

A I and II
B I and IV
C II and III
D III and IV

5. Dani carried out an experiment by placing an equal number of been seeds into two test tubes under different conditions to germinate.

[Applying]



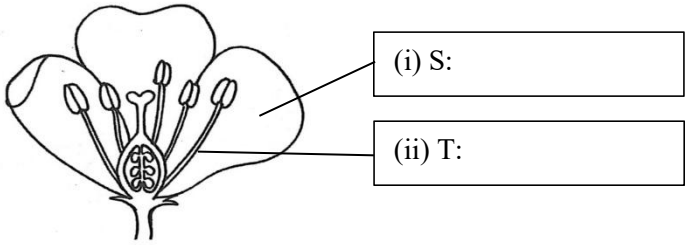
Dani was trying to determine if ……. was needed for the seed to germinate.

A Air
B Light
C water
D humidity

Section B
(20 marks)

1. (a) Label the part of the flower using the words given.

Anther	Filament	Petal



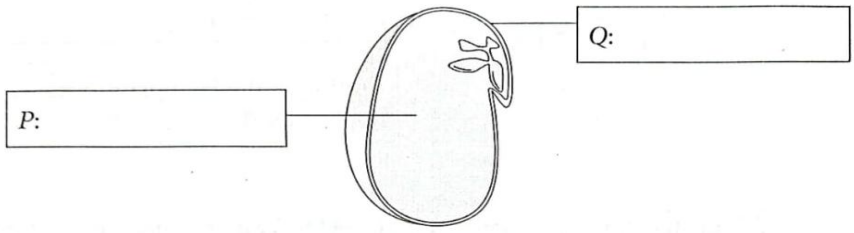
[2 marks]
[Remembering]

(b) Based on the diagram above, mark (✓) for the correct statements for the part of the flower, T.

Statements	Mark (✓)
(i) Usually colourful.	
(ii) The male part of the flower.	
(iii) Holds up the anther.	

[2 marks]
[Understanding]

2. Diagram shows the structure of a seed.



(a) State P and Q using the given words.

Testa	Micropyle	Cotyledon

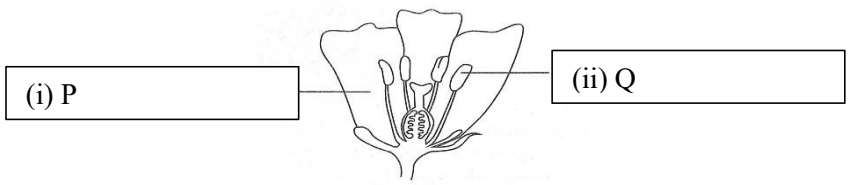
[2 marks]
[Remembering]

(b) Based on the diagram above, mark (✓) for the correct statements.

	Statements	Mark (✓)
(i)	P stores and supply food for seed germination.	
(ii)	Q absorbs air and breaks open for seed germination.	
(iii)	P and Q play important role for seed germination.	

[2 marks]
[Understanding]

3. (a) Label the parts of the flower using the words given.



Sepal	Petal	Anther

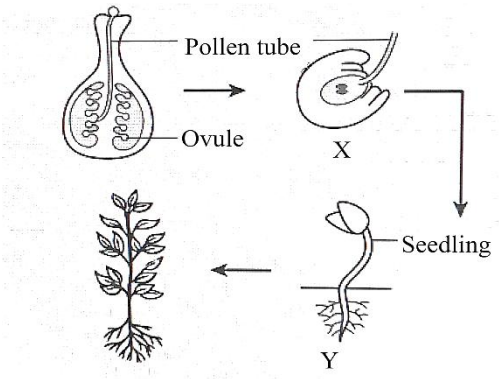
[2 marks]
[Remembering]

(b) Based on the diagram above, mark (✓) for the correct statements.

	Statements	Mark (✓)
(i)	P is colourful to attract insects.	
(ii)	Q produces a lot of nectar for pollination.	
(iii)	P and Q play important role for pollination.	

[2 marks]
[Understanding]

4. (a) Diagram shows the life cycle of a plant. State process that happened in X and Y using the given words.



(i) X :

(ii) Y :

Pollination	Germination	Fertilisation

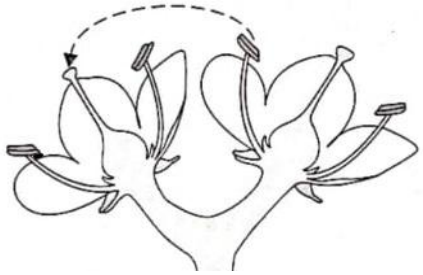
[2 marks]
[Remembering]

(b) Based on the diagram above, mark (✓) the correct statements for process Y to happen.

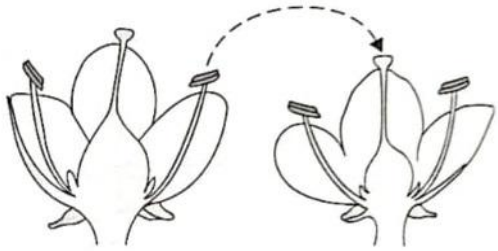
Statements	Mark (✓)
(i) Warm water, cold air and low temperature play important role.	
(ii) Sunlight is not necessary for the Process Y to happen.	
(iii) Process Y is a sexual reproduction.	

[2 marks]
[Understanding]

5. (a) Diagram shows types of pollination in flowers.



Same plant



Different plants

R:

S:

State the type of pollination in R and S using the given words.

Cross pollination	Self pollination	Artificial pollination

[2 marks]
[Remembering]

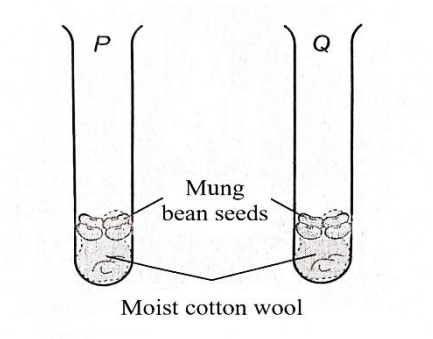
(a) Based on the diagram above, write TRUE for the correct statements or FALSE for the incorrect statements about Pollination S.

Statements	TRUE or FALSE
(i) Less variety in the seedling.	
(ii) More variety in the seedling.	
(iii) Resistance to diseases in the seedling is high.	

[2 marks]
[Understanding]

Section C
(8 marks)

1. Diagram shows a set-up apparatus to study about seed germination.



Test tube P was left in refrigerator (5˚C) and test tube Q was left at room temperature (30˚C). The table shows the results.

Number of days	2	4	6	8	10
Total length of radicles in the test tube P (cm)	0	0	0	0	0
Total length of radicles in test tube Q (cm)	1	2	4	6	8

(a) State related variables in this experiment:
(i) Manipulated variable : _____
(ii) Constant variable : _____

[2 marks]
[Controlling variable]

(b) State **one** observation for test tube P? Explain your answer.

_____

_____

[2 marks]
[Making inferences]

(c) State the relationship between germination of seeds and temperature.

_____

_____

[2 marks]
[Interpreting data]

(d) Predict the condition of the seeds in test tube Q if the moist cotton wool is replaced with dry cotton.

_____

[1 mark]
[Making prediction]

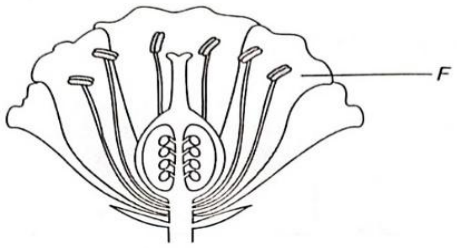
(e) State the conclusion for this experiment.

_____

[1 mark]
[Making conclusion]

A4: Assessment

1. Diagram shows the longitudinal section of a flower.



(a) Complete the following table with the structure of flowers.

Male reproductive organ	Female reproductive organ

[2 marks]

(b) Explain the importance of structure F in pollination.

_____

_____

[2 marks]

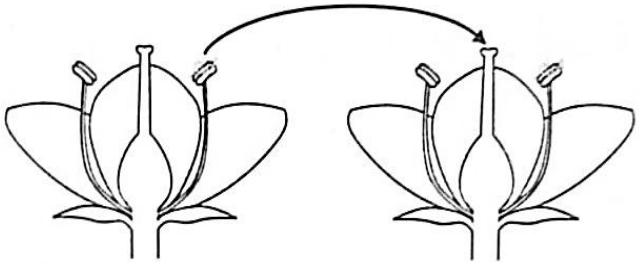
(c) Explain one common characteristics of flower that is pollinated by animals and insects.

_____

_____

[2 marks]

2. Diagram shows a pollination process in different plants.



Flower A Flower B

(a) State the type of pollination shown in the diagram.

_____

[1 mark]

(b) State two advantages of this type of pollination.

_____

_____

[2 marks]

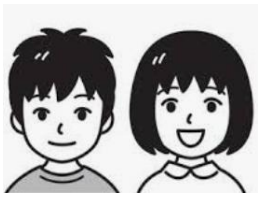
Session 8	
Learning Area	5.0 Matter
Content Standard	5.1 Matter in Nature
Learning Objective	Student will be able to accomplish the tasks regarding the characteristics of matters, physical properties and chemical properties
Learning Focus	1. Almost all living things that exists in nature is matter. 2. Living and non-living thing have mass and occupy space. 3. Differentiate the physical and chemical properties of matter.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) 3. Assessment (Refer to A3) 4. Answer scheme (Refer to A4)

A1: Smart Learning Notes

What is a matter?

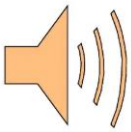
Substance that has **mass** and **occupies space.**

All living and non-living things including humans, animals, plants, water rocks and soil are classified as matter.

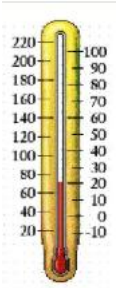




However, few things like heat, sound, light, and electricity are non-matters, because they do not have mass.

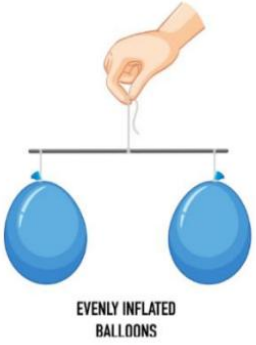

Sound

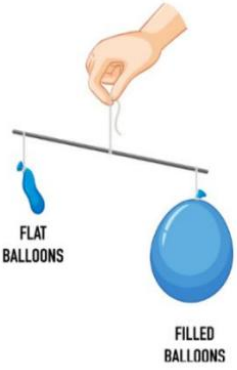

Light



heat

To show that air has mass and occupies space



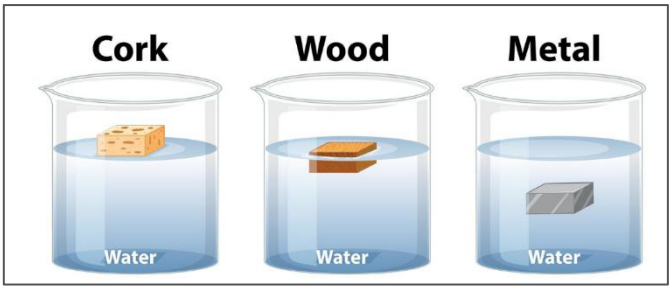




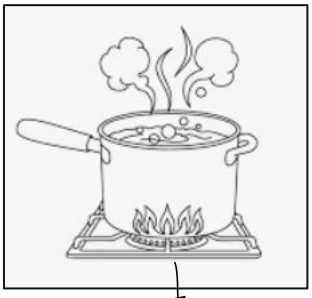
Physical Properties of Matter

i. Properties that can be identified by using our five senses or measuring tools without changing its composition. A new substance is not formed.

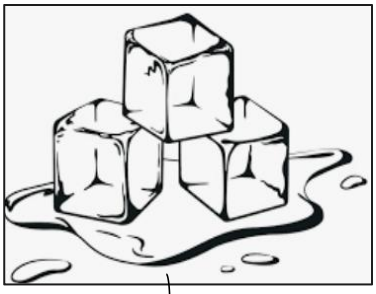
ii. Example: - Melting, freezing and boiling points
- Solubility
- Heat conductor and heat insulator
- Density



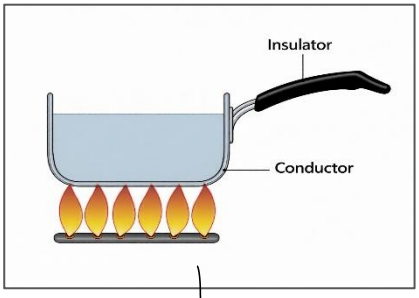
Density



The boiling point of water is 100 °C



Ice melts when exposed to a certain temperature



The handle is made of heat insulator such as plastic and the pan is made of heat conductor such as steel

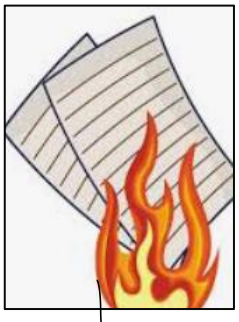
Chemical Properties of Matter

i. Properties of a substance that become evident when it changes to a new substance.

ii. Example: - Rusting
- Flammability



Iron key rusts when it is exposed to air and water



Paper burns when it is lit

A2: UASA
Section A (5 marks)

1. Which of the following statements is true about matter?

A Matter occupies space
B Matter does not have volume
C Non-living things are not matter
D Matter cannot exist in the form of gas

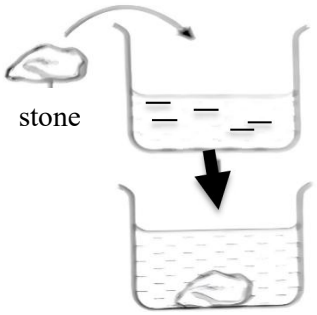
[Remembering]

2. Which of the following sequences is correct about the melting points of matters in ascending order?

A Water → copper → oxygen → alcohol
B Oxygen → alcohol → water → copper
C Copper → oxygen → alcohol → water
D Alcohol → water → copper → oxygen

[Understanding]

3. Diagram shows an activity carried out by a student.



What can you conclude from the observation?

A Water has mass
B The stone has mass
C The stone occupies space
D The stone has a fixed shape

[Understanding]

4. Which of the following is the chemical property of a matter?

A Rusting
B Melting
C Conductivity of heat
D Solubility of salt in water

[Remembering]

5. Table shows the mass and volume of various substances.

Substances	Mass (g)	Volume (cm^3)
W	550	500
X	350	290
Y	200	100
Z	50	15

Which of the following substances has the highest density?

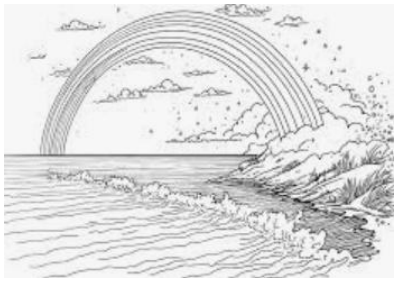
$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

A W
B X
C Y
D Z

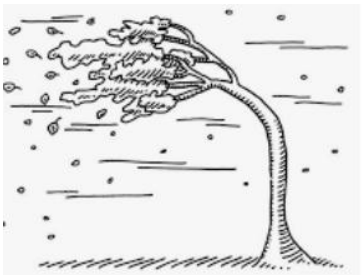
[Understanding]

Section B
(20 marks)

1. a) Mark (√) examples of non- matters.



Rainbow ☐



Air ☐



Shadow ☐

[2 marks]

[Remembering]

b) Mark (√) for the correct statements about the matters.

Statements	Mark (√)
(i) Chemical properties of matter involve the formation of new substances.	
(ii) Heat conductivity is an example of physical properties of matter.	
(iii) Rusting of nails do not involve the formation of new substances.	

[2 marks]

[Understanding]

2. a) Fill in the blanks using word givens.

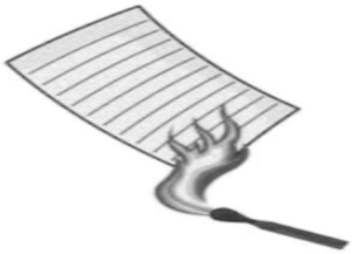
100°C	dissolve	burn

i. Water boils at _____ while the melting point is 0 °C.

ii. Sugar can _____ in water.

[2 marks]
[Remembering]

b) Diagram shows a property of matter.



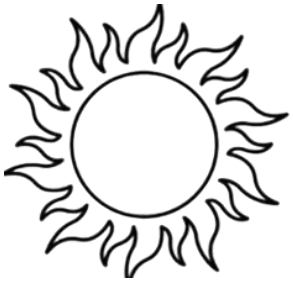
Mark (√) for the correct statements.

Statements	**Mark (√)**
(i) A new substance is not formed.	
(ii) It is a chemical property of matter.	
(iii) It involves energy change.	

[2 marks]
[Understanding]

3. a) Circle the examples of matters.







[2 marks]
[Remembering]

b) Diagram shows the condition of a nail.



Write **TRUE** for the corrrect statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
(i) Rusting occurs on iron when it is exposed to water and air.	
(ii) Rusting can be prevented by coating the iron.	
(iii) The chemical name of rust is zinc oxide.	

[2 marks]
[Understanding]

4. a) Write the letter **C** for **Chemical property** and the letter **P** for **Physical property** of matter.

i. 

ii. 

[2 marks]
[Remembering]

b) Diagram shows the condition of a balloon after three days.

balloon 

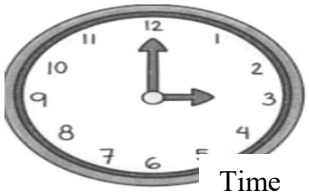
Mark (√) for the correct statements about the condition of the balloon.

Statements	Mark (√)
(i) The air occupies space.	
(ii) The air has mass.	
(iii) The balloon is not a matter.	

[2 marks]
[Understanding]

5. a) Circle the matters.





Time



[2 marks]

[Remembering]

b) Diagram shows an apparatus in the science laboratory.



Mark **(√)** for the correct statements.

	Statements	Mark (√)
(i)	The apparatus containing water are matters.	
(ii)	Both apparatus and water have mass and occupy space.	
(iii)	The air in the apparatus is not a matter.	

[2 marks]

[Understanding]

Section C
(8 marks)

1. Diagram shows an activity carried out by a clown.



a) Mark(√) the state of matter in the balloon.

solid		gas	

[1 mark]
[Remembering]

b) Explain wheather the balloon considered as a matter.

_____

_____

[2 marks]
[Understanding]

c) Explain the condition of the balloon shown in the diagram.

_____

_____

[2 marks]
[Understanding]

d) Diagram shows an action done by a boy. Justify his action and how this action helps the bicycle to move smoothly.



_____

_____

_____

[3 marks]
[Analysing]

A3: Assessment

1 . Fill in the blanks.

Everything in nature exists as _____ and _____ .

[2 marks]
[Remembering]

2. Diagram shows an activity occurs at an ice-cream stall.



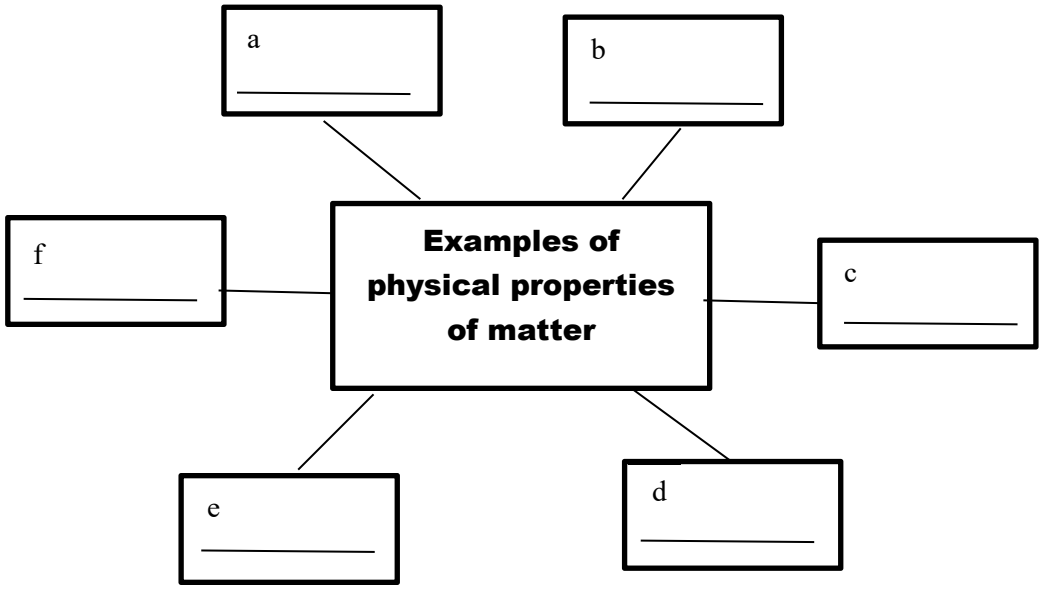
Explain how does the ice cream seller ensure the ice creams do not melt easily.

_____

_____

[2 marks]
[Application]

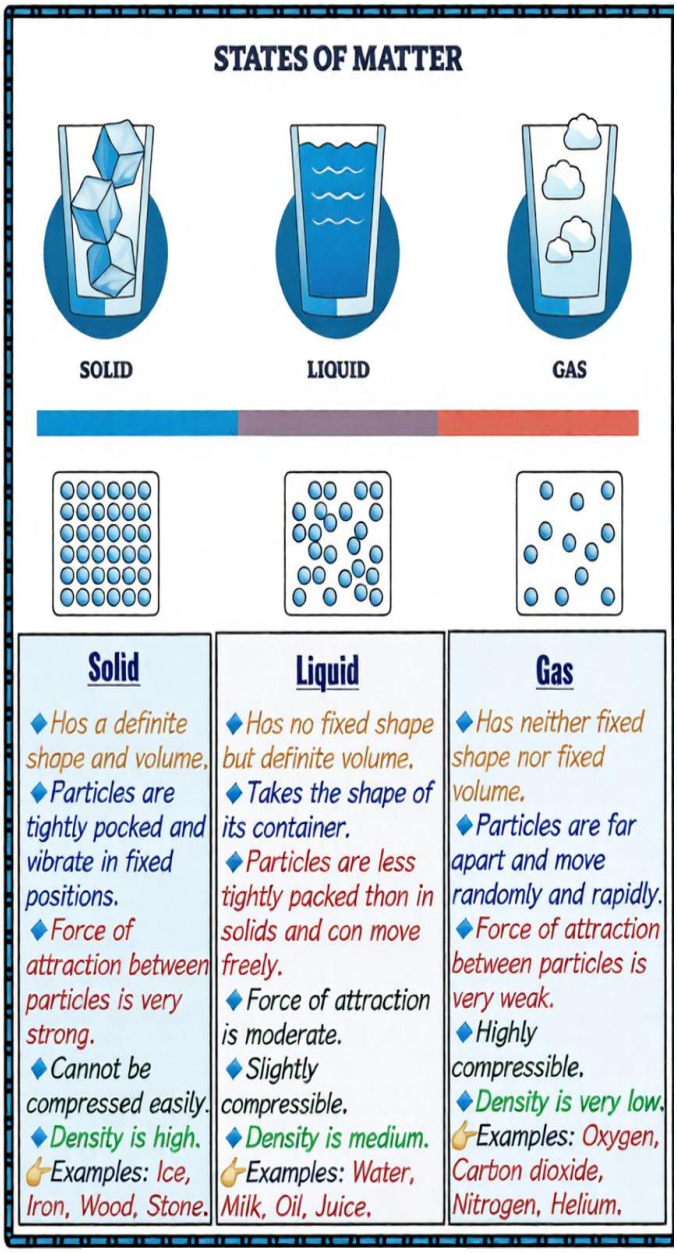
3. Complete the diagram.



[6 marks]
[Remembering]

Session 9	
Learning Area	5.0 Matter
Content Standard	5.2 Three States of Matter
Learning Objective	Student will be able to accomplish the tasks regarding the three states of matter, different rate of diffusion of particles in three states of matter and the constant temperature during melting/ freezing and boiling.
Learning Focus	1. The contrast of the three states of matter 2. The different rate of diffusion of particles in three states of matter 3. The constant temperature during melting, freezing and boiling
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. Technique of answering. (Refer to A2) 3. UASA-format items Enhancement Exercises (Refer to A3) 4. Assessment (Refer to A4) 5. Answer scheme (Refer to A5)

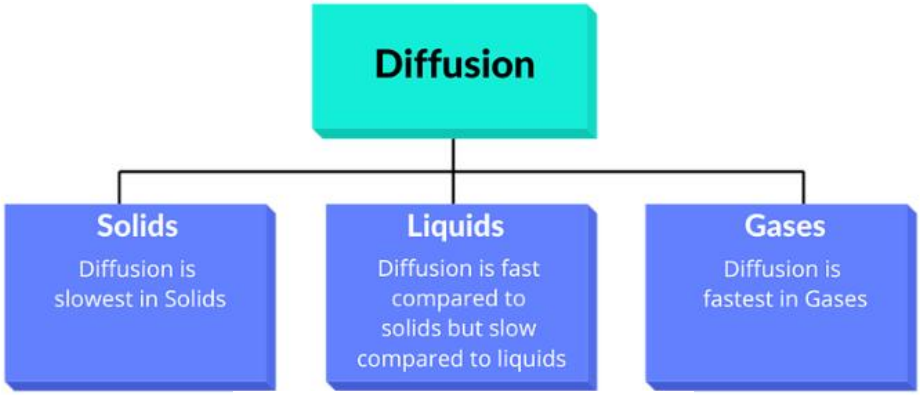
A1: Smart Learning Notes



Source: officialpurephysics

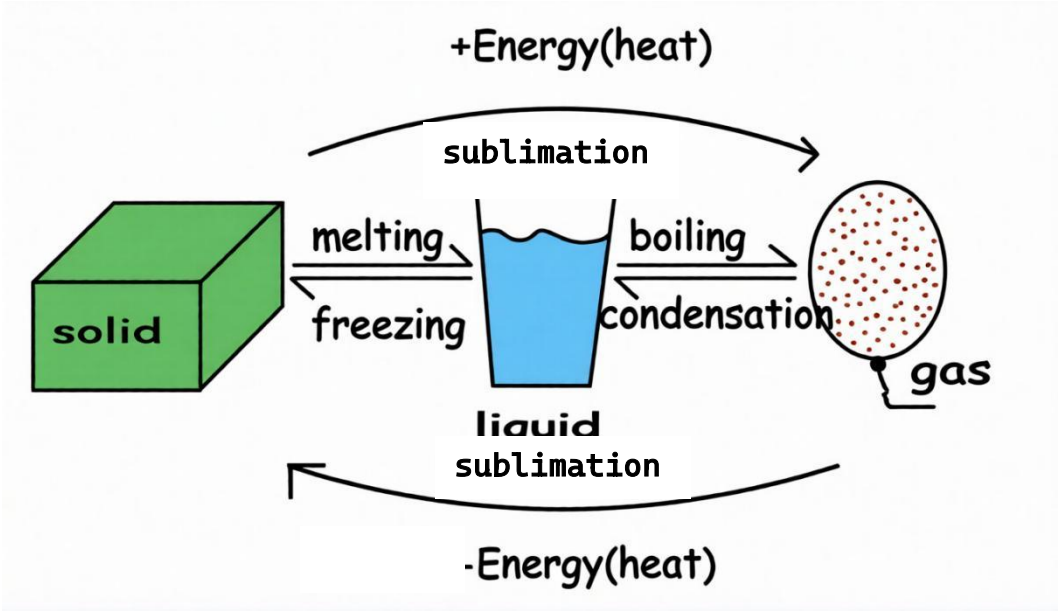


Source: https://www. science-matter-and-energy/75748390



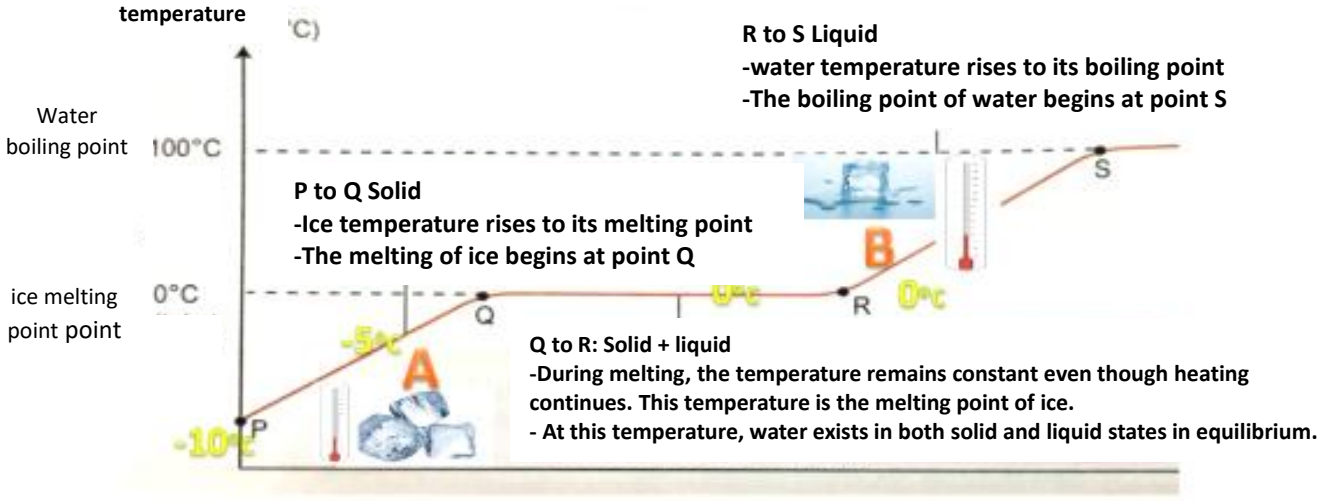
Source: https://www.teachoo.com

The effect of heat on matter



Source: https://www.chemistrytutorials.org

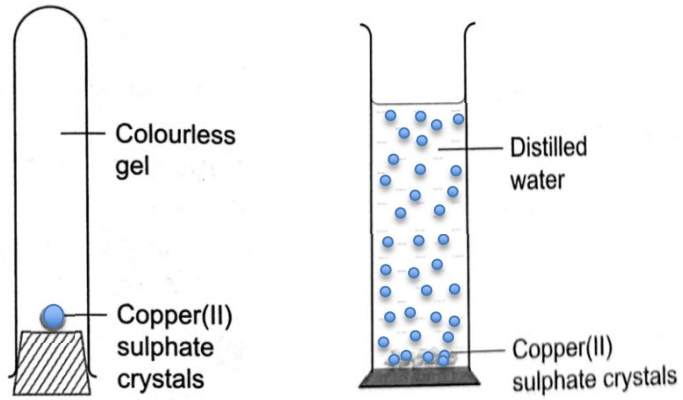
The temperature remains constant during physical changes



A2: Technique of answering

Science Process Skills

Diagram shows an apparatus set up left for 5 minutes to determine the rate of diffusion of particles between solid and liquid.



(a) State the observation of this experiment.

The blue colour spreads upwards very slowly in the gel while the blue colour spreads upwards in the distilled water.

What can be observed in the diagram?

[1 mark]
[Observing]

(b) State the inference based on the observation at (a).

The rate of diffusion of particles is low in a solid but high in a liquid.

Inference: Observation + Explanation to the observation

[1 mark]
[Making inference]

(c) Identify the variables for the experiment.

.

(i) Manipulated variable
Diffusion medium

(ii) Responding variable
Rate of diffusion of particles

(iii) Constant variable
Surrounding temperature

Manipulated variable:
Aspect/factor that is purposely changed on apparatus

Responding variable
Aspect/factor that is observed and recorded

Constant variable
Aspect/factor that is unchanged/remained

[3 marks]
[Controlling the variables]

(d) State one precautionary step that need to be taken when conducting this experiment.
The colourless gel and distilled water used are in room temperature.

Refer to the constant variables

[1 mark]
[Experimenting]

(e) State the operational definition for diffusion.
Diffusion is the process of spreading of blue colour upwards when copper (II) sulphate crystals are placed into colourless gel and distilled water.

Operational definition: Observation + Condition/steps taken to produce the observation

[1 mark]
[Defining operationally]

(f) State the conclusion of this experiment.
The rate of diffusion of particles is low in a solid but high in a liquid.

Refer to Hypothesis
- shows the relationship between manipulated variables and responding variables

[1 mark]
[Making conclusion]

Source: Science Process Skills Form 1 Sasbadi

A3: UASA
Section A (5 marks)

1. Which of the following processes releases heat?

A Melting
B Boiling
C Evaporation
D Condensation

[Remembering]

2. Diagram shows the arrangement of particles in substance S.

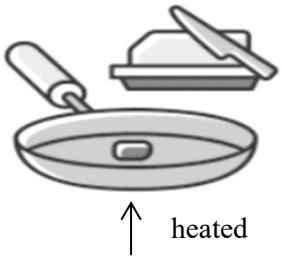


Which of the following is the substance S?

A Mirror
B Oxygen
C Apple juice
D Carbon monoxide

[Understanding]

3. Diagram shows the condition of a piece of butter on a pan.



What is the change in the state of matter that occurs to the butter?

A Melting
B Evaporation
C Sublimation
D Condensation

[Understanding]

4. The information is about the substance P.

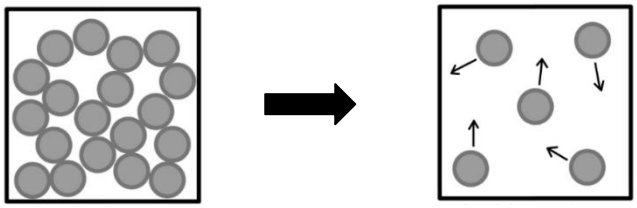
The particles of substance P are very far apart from one another.

Which of the following represents substance P?

A Ice
B Alcohol
C Cooking oil
D Carbon dioxide

[Understanding]

5. Diagram shows the changes of particles in a process **Y**.



What is the process **Y**.

A Boiling
B Melting
C Sublimation
D Condensation

[Understanding]

Section B
(20 marks)

1. a) Underline the correct answers about the changes in the state of matter.

i) During melting, the particles (absorb / release) heat and vibrate faster.
ii) The particles absorb heat, move faster and further apart with one another during (condensation / boiling).

[2 marks]
[Remembering]



b) Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Vapour produced from hot coffee is gas.	
ii) Kinetic theory of matter states that matter is made up of static small particles.	
iii) Particles in coffee move freely in all directions.	

[2 marks]
[Understanding]

2. a) Fill in the blanks using the words given.

i). Heat is _____when water is heated.

ii). Heat is _____when water is cooled.

absorbed	released	increase

[2 marks]
[Remembering]

b) Dagrams show two changes in states of matter, P and Q.



P



Q

Mark (√) the correct statements.

Statements	Mark (√)
i) Boiling is a process in which the particles of substances are heated from low temperature area to a high temperature area.	
ii) One example of process Q in daily life is the formation of water droplet in the cloud.	
iii) Energy is released during the process Q.	

[2 marks]

[Understanding]

3. a) Underline the correct answers.

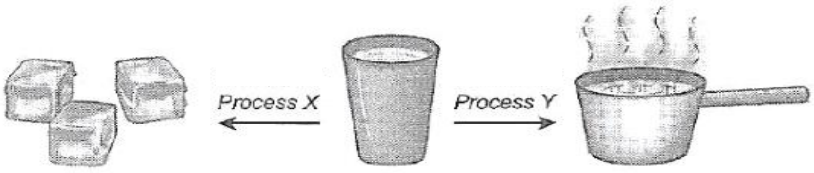
i) When heated, the distance between the particles in a substance will (increase / decrease).

ii) The particles in the (solid / gas) have the highest kinetic energy.

[2 marks]

[Remembering]

b) Diagram shows the effect of heat on matter.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Process X absorbs heat while process Y releases heat.	
ii) The kinetic energy increases when process Y occurs.	
iii) Process X causes the kinetic energy to increase.	

[2 marks]

[Understanding]

4. a) Circle the correct answers about the temperature during freezing and boiling.

i) When the temperature of water reaches the (boiling / freezing) point, the particles move freely and randomly.

ii) Particles start to vibrate at a fixed position when they reach (boiling / freezing) point.

[2 marks]
[Remembering]

b) Diagrams show the changes of states of matter that occur in daily life.

P: Preparation of salt from seawater



Q: Cloud formation



R: Mothballs shrink

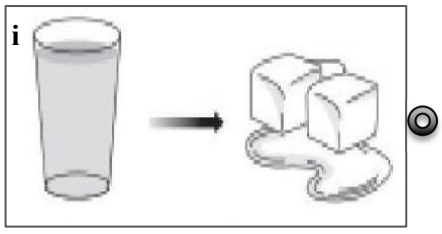
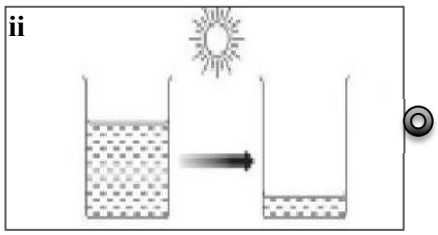


Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Process P and R absorb heat while process Q releases heat.	
ii) The kinetic energy increases when process Q occurs.	
iii) Process R causes the kinetic energy to decrease.	

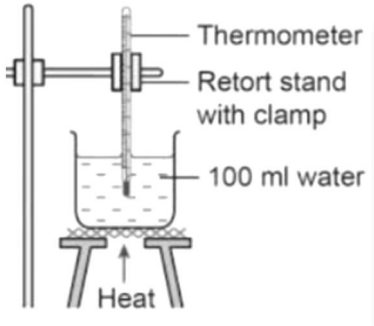
[2 marks]
[Understanding]

5 a) Match the process with the situation that occur in daily life.

Situation	Process
i 	Evaporation
	Condensation
ii 	Freezing

[2 marks]
[Remembering]

b) Diagram shows the study on temperature of water.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) The temperature remains constant during boiling of water.	
ii) When substance is heated, the temperature will increase.	
iii) The temperature will change when it reaches freezing point and melting point.	

[2 marks]

[Understanding]

Section C
(10 marks)

1. Diagram shows an experiment to study the change of water temperature during boiling.

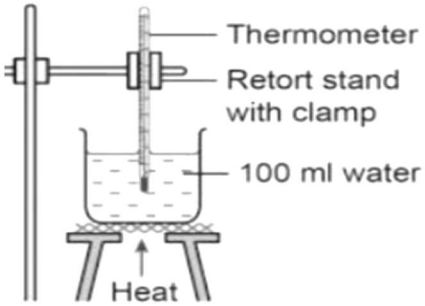


Table shows the result of the experiment.

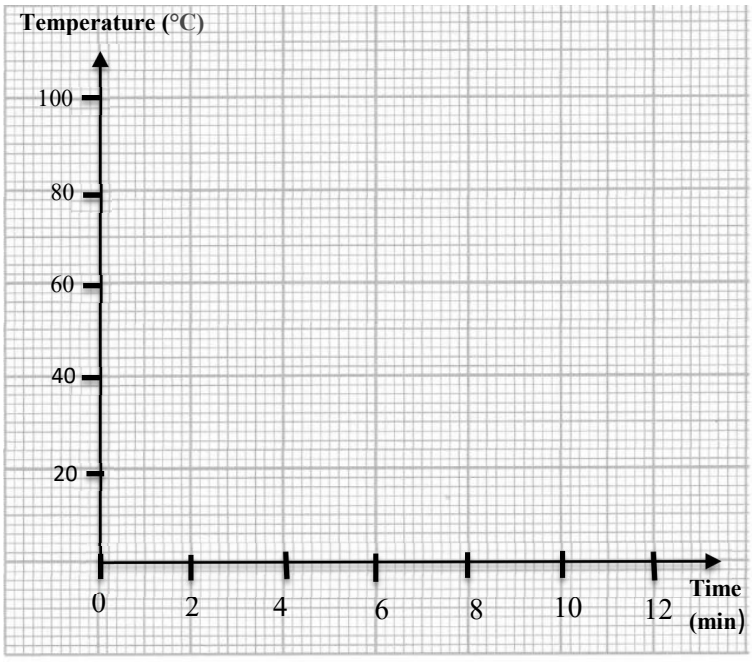
Time (minute)	0	2	4	6	8	10	12
Temperature (°C)	20	40	60	80	100	100	100

a) State an observation for the experiment.

_____

[1 mark]
[Observing]

b) Based on the result of the experiment, draw a graph of the temperature against time.



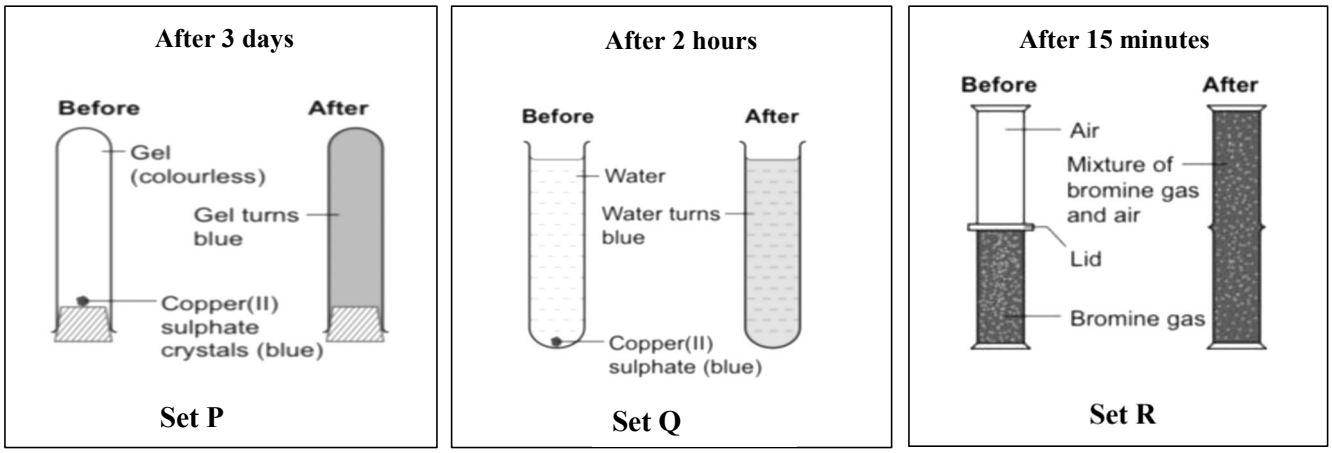
[2 marks]
[Interpreting data]

c) Predict the temperature of water after 20 minutes

_____

[1 mark]
[Predicting]

2. Diagram shows an experiment to study the rate of diffusion in matters.



Source: Science textbook form 1

a) State an observation for set R.

_____

[1 mark]
[Observing]

b) State an inference based on the observation in (a).

_____

[1 mark]
[Making inference]

c) Identify the variable for the experiment.

i. Manipulated variable: _____

ii. Responding variable: _____

[2 marks]
[Controlling the variables]

d) Predict what will happen if copper (II) sulphate, in set Q is replaced with potassium permanganate crystal.

_____

[1 mark]
[Analysing]

e) State the operational definition for the diffusion of Set P.

_____

[1 mark]
[Defining operationally]

A4: Assessment
(15 marks)

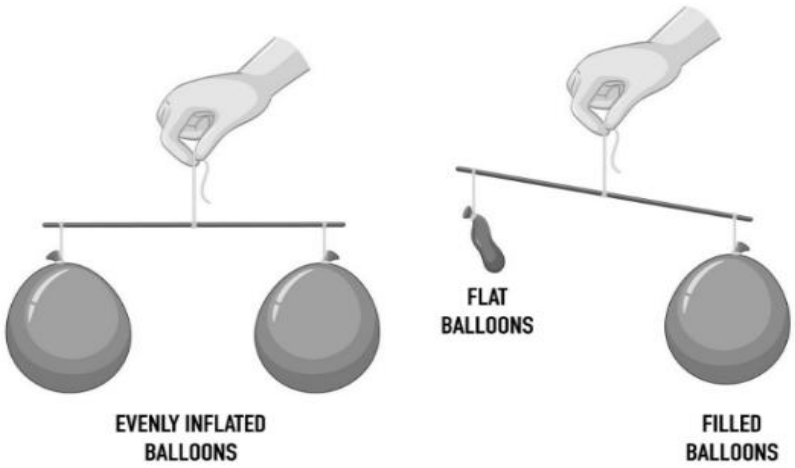
1 . Draw the arrangement of the particles in the three states of matter in the boxes provided.

Solid Liquid Gas

[3 marks]
[Remembering]

2. State the conclusions for the activities below.

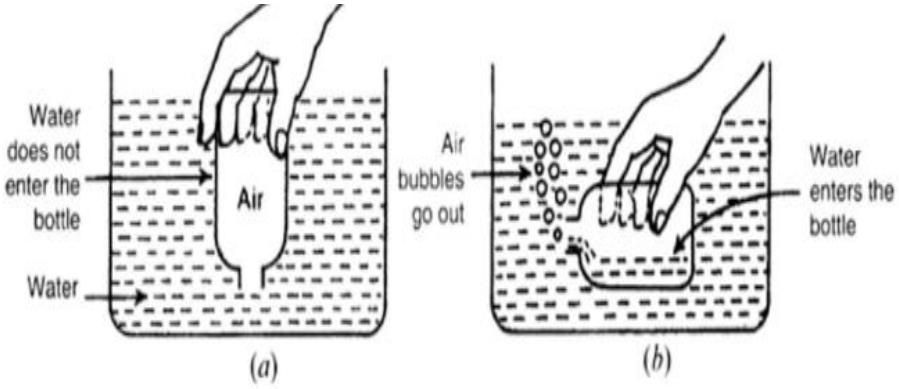
(a)



Conclusion: _____

[1 mark]
[Making conclusion]

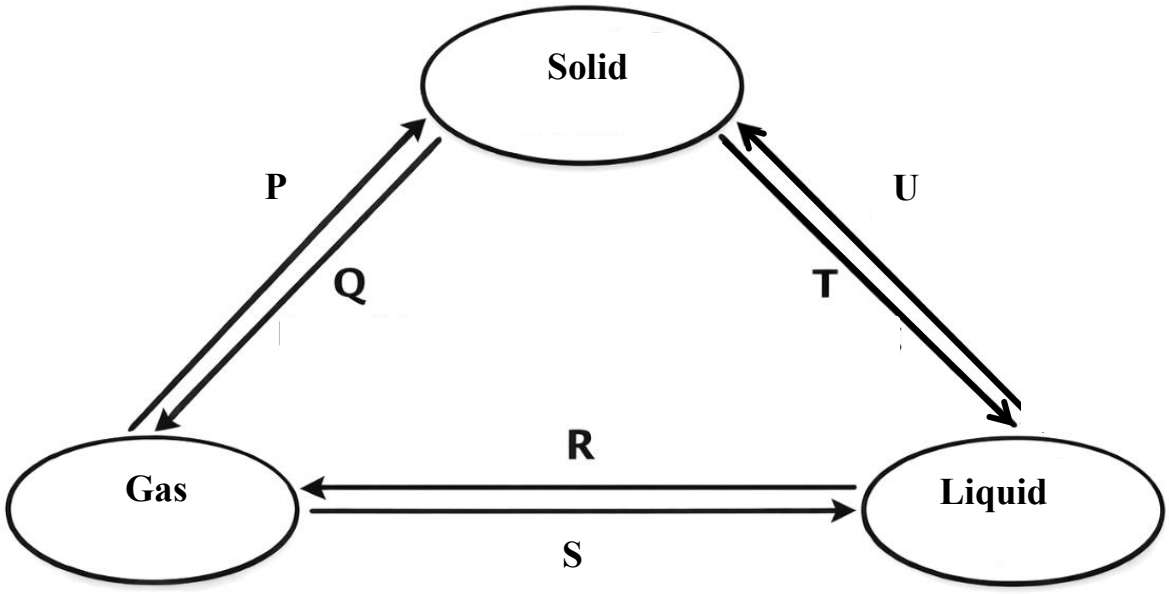
(b)



Conclusion: _____

[1 mark]
[Making conclusion]

3. State the processes in the diagram.



P: _____ **Q**: _____

R: _____ **S**: _____

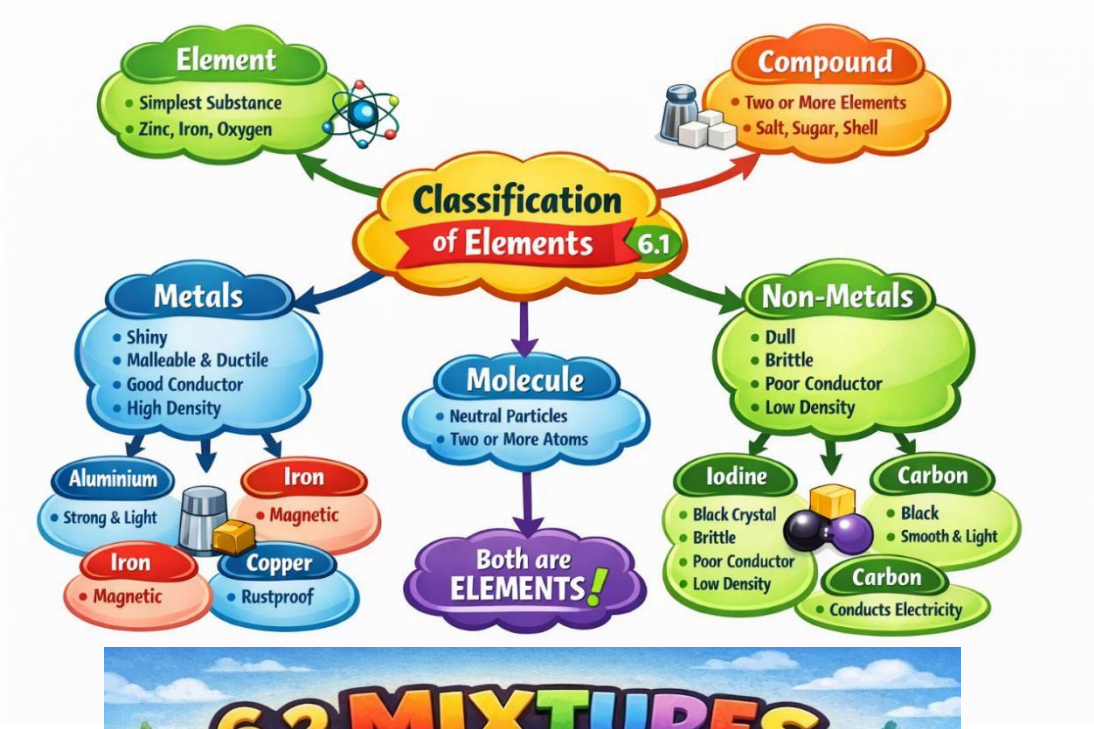
T: _____

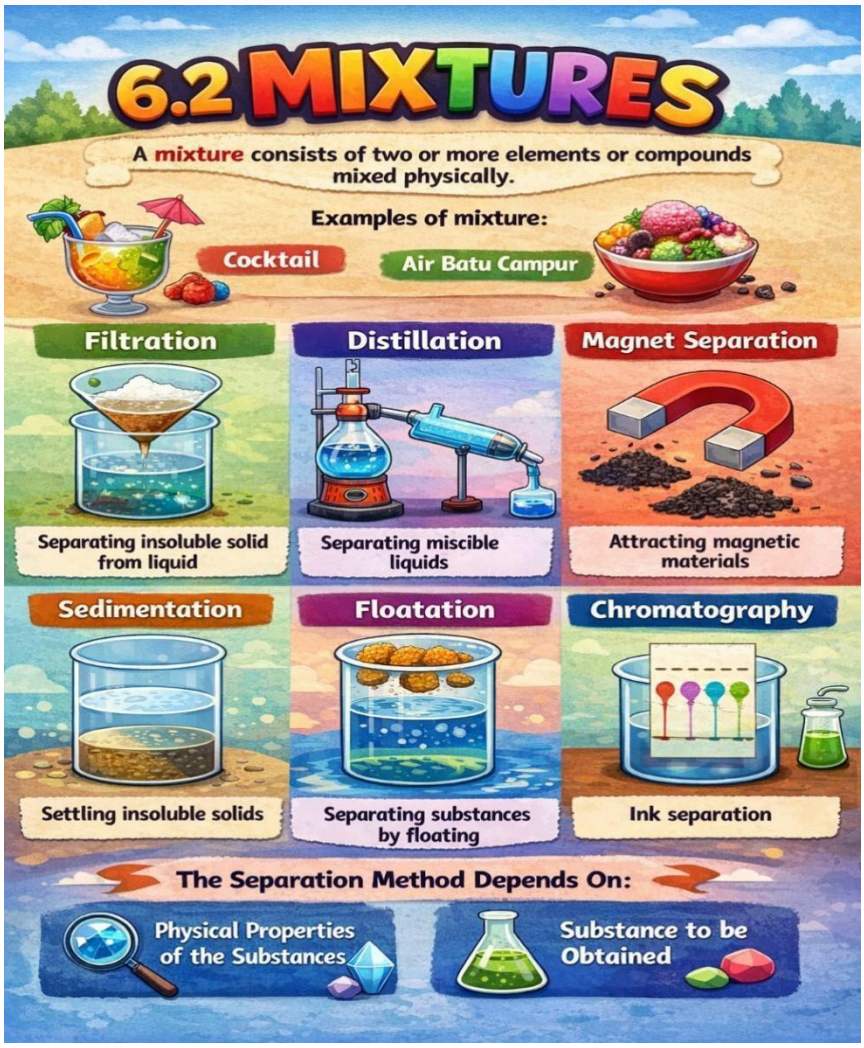
[5 marks]

[Remembering]

Session 10	
Learning Area	6.0 Periodic Table
Content Standard	6.1 Classification of elements 6.2 Mixtures
Learning Objective	Students will be able to accomplish the tasks regarding the classification of elements and mixture.
Learning Focus	1. Introduction of atoms, element, mixture and compounds, characteristics of metals and non-metals. 2. Six methods of separating the mixtures.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) 3. Assessment (Refer to A3) 4. Answer schemes (Refer to A4)

A1: Smart Learning Notes





Source: https://chatgpt.com/c/6978417f-67b8-83a1-bc85-70fdf3aad0bd

A2: UASA-format items Enhancement Exercises

Section A (8 marks)

1. Which of the following is an element?

A Salt
B Sugar
C Water
D Oxygen

[Remembering]

2. Diagram shows a stationary.



X

Which of the following shows the property of X?

A Shiny
B Brittle
C Malleable
D Good conductor of electricity

[Understanding]

3. Diagram shows a pair of copper wires.



Which of the following shows the property of copper wires?

A Dull
B Brittle
C Poor conductor
D Malleable and ductile

[Understanding]

4. Diagram shows a substance made of an element.



Which characteristic of the element makes the substance suitable for this use?

A Low density
B Dull appearance
C High tensile strength
D Poor electrical conductivity

[Understanding]

5. Diagram shows two different type of elements.



Which of the following is the property to distinguish both type of the elements?

A Colour
B Density
C Size of atoms
D Electrical conductivity

[Understanding]

6. What is meant by a mixture?

A A pure substance
B Electrical conductivity
C A chemical combination of substances
D Two or more elements or compounds mixed physically

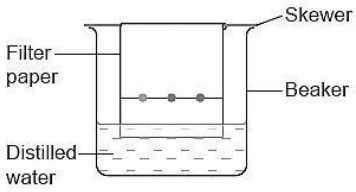
[Remembering]

7. Which of the following is the method used to separate undissolved coffee powder from the drink?

A Filtration
B Distillation
C Magnetism
D Chromatography

[Remembering]

8. Diagram shows the equipment used for the separation of substances.



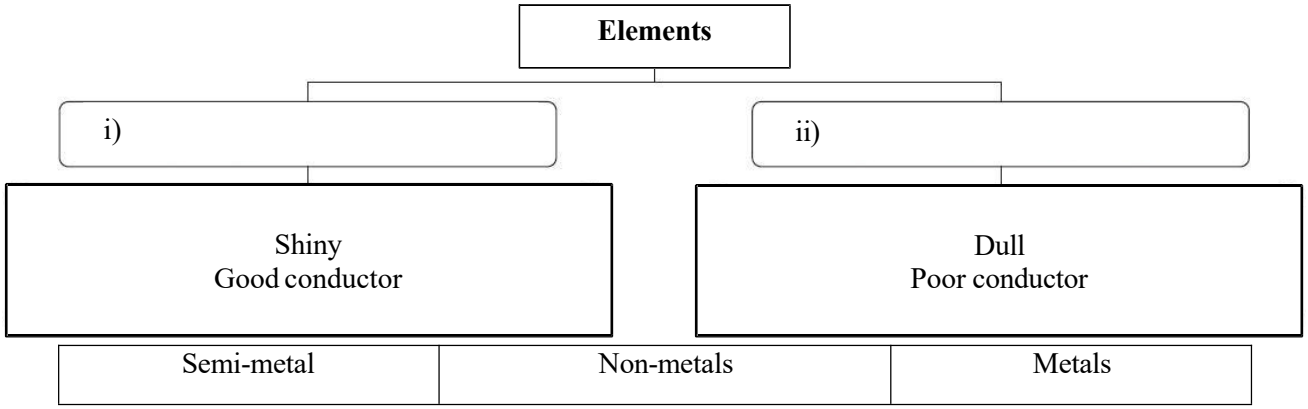
Which of the separation methods is commonly used to detect document fraud?

A Filtration
B Distillation
C Sedimentation
D Chromatography

[Understanding]

Section B (16 marks)

1. a) Complete the tree map with the words given.



[2 marks]

[Remembering]

b) Diagram shows two examples of elements.





Mark (√) for the correct statements about the elements.

Statements	Mark (√)
i) Both are metals.	
ii) Iron fences used at homes are classified as elements.	
iii) Mixture consists of two or more elements combined chemically.	

[2 marks]

[Understanding]

2. a) Diagram shows two substances, P and Q.





P:

Q:

State the type of metal in both substances using the words given.

Copper	Zinc	Iron

[2 marks]

[Remembering]

b) Diagram shows a non-metal substance.



Write **TRUE** for the correct statements or **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) This substance has a low density.	
ii) This substance has a shiny surface.	
iii) This substance is a poor conductor of electricity.	

[2 marks]

[Understanding]

3. a) Underline the correct answers for the following statements.

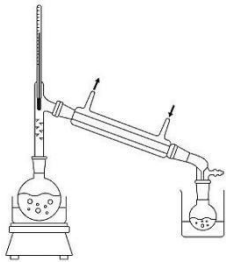
i) (Mixture /Molecule) consists of two or more elements or compound mixed physically.

ii) A (filtration/chromatography) separation method is used to check document fraud by separating the colours from the ink used.

[2 marks]

[Remembering]

b) Diagram shows the separation method of mixtures.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE** or **FALSE**
i) To separate water and oil.	
ii) To separate water and ethanol.	
iii) To separate soluble and insoluble material.	

[2 marks]

[Understanding]

4. a) Underline the correct answers about the separation method of mixtures.

i) To separate soil and water, using (sedimentation, floatation) separation method.

ii) Separation by using (magnet, filter paper) is used to separate sand and iron nail.

[2 marks]

[Remembering]

b) Diagram shows a type of beverage.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

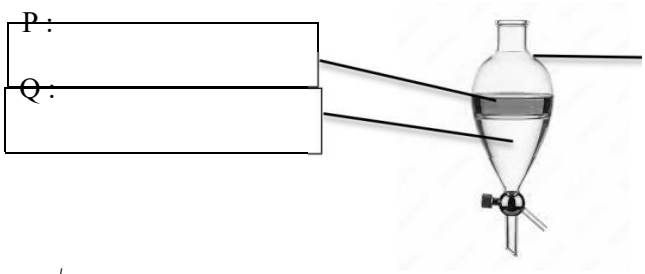
Statements	**TRUE** or **FALSE**
(i) Mix fruits consists of two or more elements or compound mixed physically	
(ii) Mix fruits consists of two or more elements or compound combined chemically.	
(iii) Mix fruits retain its original properties when combined physically.	

[2 marks]

[Understanding]

Section C (10 marks)

1. Diagram shows the apparatus set-up to separate a mixture of P and Q.



Separating funnel

a) Mark (√) for examples of mixtures.

Salt	Cocktail	Fruit salad

[2 marks]

[Remembering]

b) State the separation method above.

_____

[1 mark]
[Understanding]

c) Label the substances P and Q on the diagram.

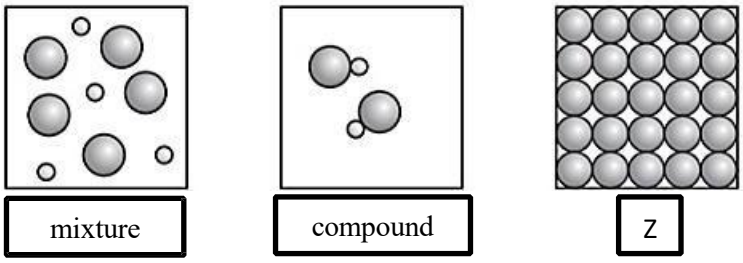
[2 marks]
[Understanding]

d) State one method to separate water and ethanol .

_____

[1 mark]
[Understading]

e) Diagram shows three types of matter in nature.



State the type of matter Z.

_____

[1 mark]
[Understanding]

f) Compare and contrast between a mixture and a compound.

Similarity:

_____

Differences:

i :_____

ii :_____

[3 marks]

[Analysing]

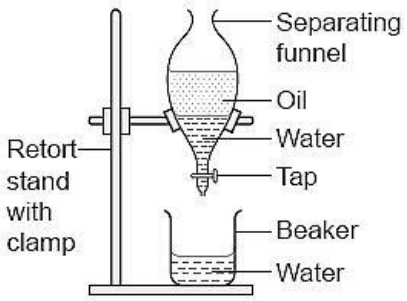
A3: Assessment
(12 marks)

1. Match the following mixtures according to its suitable separation method.

Mixture	Separation method
Iron powder and sand	Filtration
Alcohol and water	Magnet
Coffee drink and coffee powder	Distillation
Water and sand	Cromatography
Oil and water	Sedimentation
Colouring in food	Floatation

[6 marks]
[Remembering]

2. Diagram shows a separation method.



a) State the separation method.

_____

[1 mark]
[Remembering]

b) Explain the function of the separation method.

_____

[1 mark]
[Understanding]

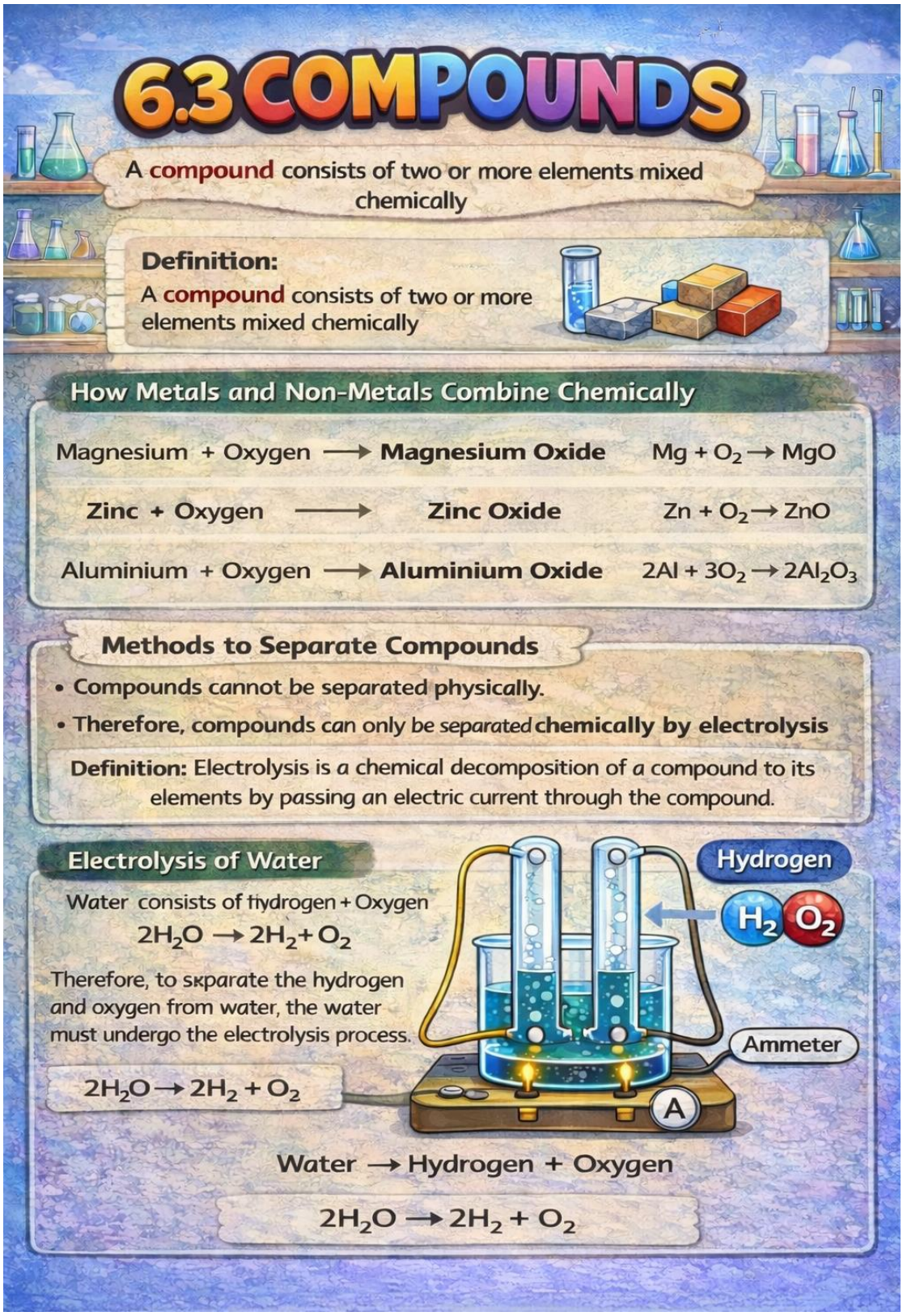
3. Complete the table to show the differences between metals and non-metals.

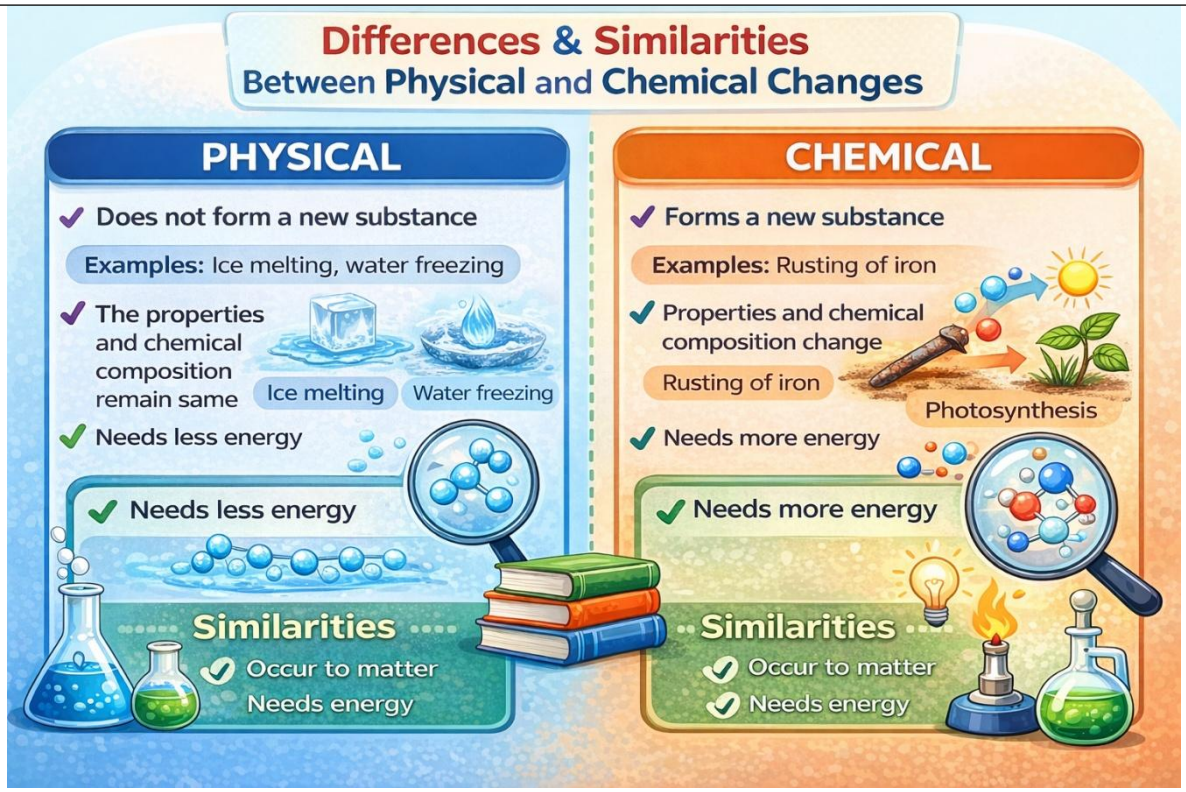
Metals	Differences	Non-metals
Shiny	**Appearance**	
	Ductility	Brittle
	Malleability	Non-malleable
High	**Density**	

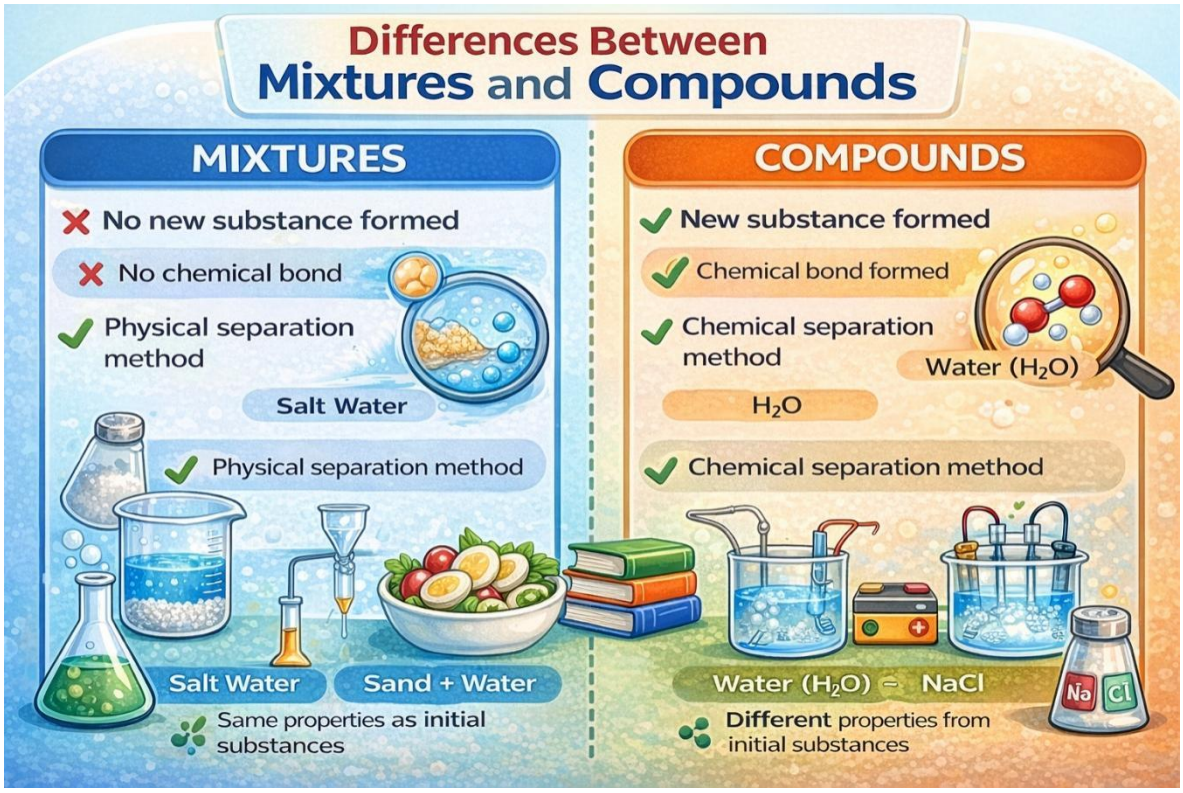
[4 marks]
[Understanding]

Session 11	
Learning Area	6.0 Periodic Table
Content Standard	6.3 Compound
Learning Objective	Students will be able to accomplish the tasks regarding the classification of compound.
Learning Focus	1. Separation method of compound: Electrolysis 2. Differences between chemical change and physical change. 3. Differences between mixtures and compounds.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) 3. Assessment (Refer to A3) 4. Answer schemes (Refer to A4)

A1: Smart Learning Notes







Source: https://chatgpt.com/c/69795f4d-80dc-8324-917c-a12fb91c2211

A2: UASA-format items Enhancement Exercises

Section A (5 marks)

1. Which of the following is a compound?
   A Water
   B Copper
   C Oxygen
   D Cocktail

[Remembering]

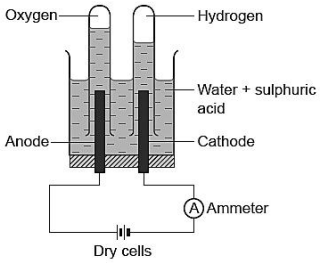
2. The word equation shows formation of metal oxide.



Which of the following elements is involved in the chemical reaction?
   A Carbon
   B Oxygen
   C Nitrogen
   D Hydrogen

[Understanding]

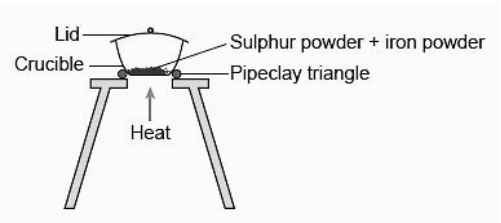
3. Diagram shows a method of separation, P.



What is the method of separation, P?
   A Respiration
   B Electrolysis
   C Photosynthesis
   D Rusting of iron

[Understanding]

4. Diagram shows an experiment set up.



What is produced from the chemical reaction above?

   A Elements
   B Mixtures
   C Molecule
   D Compound

[Understanding]

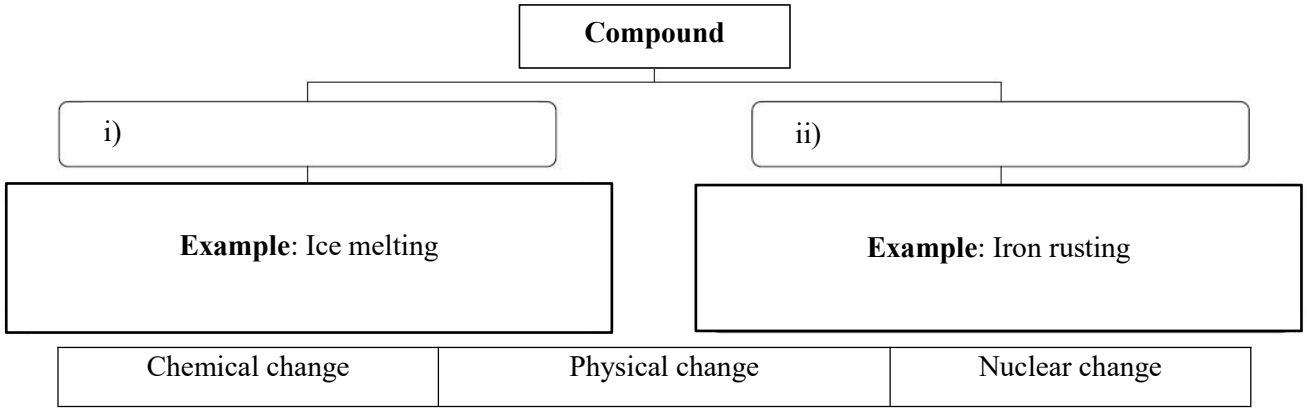
5. Which of the following is true about the pairing of physical and chemical changes?

	Physical Changes	Chemical Changes
A	Needs less energy	Needs more energy
B	Forms new substance	Does not form new substance
C	The properties of the substances and products are not the same	The properties of the substances remain the same
D	The substances and products have different chemical composition	The chemical composition of the substances remains the same

[Understanding]

Section B (16 marks)

1. a) Complete the tree map with the words given.

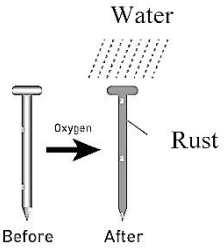


Chemical change	Physical change	Nuclear change

[2 marks]

[Remembering]

b) Diagram shows a reaction occurs in daily life.



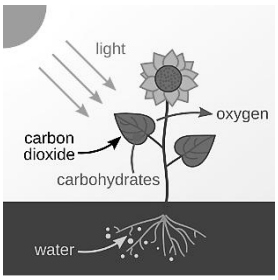
Mark (√) the correct statements about the reaction.

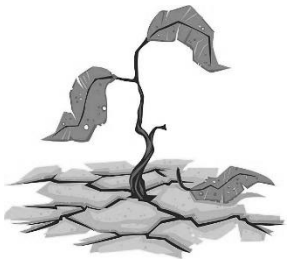
Statements	Mark (√)
i) The product of the reaction can be separated physically.	
ii) Photosynthesis is an example of a compound formed by a chemical reaction.	
iii) The product of the reaction consists of two or more elements that are mixed chemically.	

[2 marks]

[Understanding]

2. a) Diagram shows two chemical changes that occur in daily life.





M:

N:

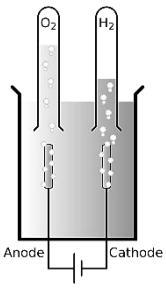
State the chemical change on the diagram using the words given.

Cell respiration	Photosynthesis	Decaying of leaf

[2 marks]

[Remembering]

b) Diagram shows how oxygen and hydrogen are separated from water.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE or FALSE**
i) The process needs high energy.	
ii) The properties of the substances remain the same.	
iii) The substances and products have different chemical composition.	

[2 marks]

[Understanding]

3. a) Underline the correct answers for the following statements.

i) (Compound /Mixture) consists of two or more elements that are mixed chemically.

ii) (Cell respiration/Ice melting) is an example of chemical change that forms a new substance.

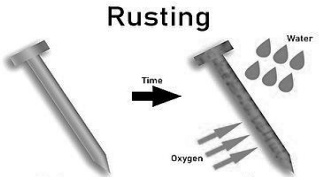
[2 marks]

[Remembering]

b) Diagram shows two reactions P and Q.



P



Q

Write **TRUE** for the correct statements and **FALSE** for the incorrect statements about the similarities of reactions P and Q.

Statements	**TRUE** or **FALSE**
i) P and Q does not form new substance.	
ii) P and Q occur to matter.	
iii) P and Q need energy.	

[2 marks]

[Understanding]

4. a) Circle the correct answers.

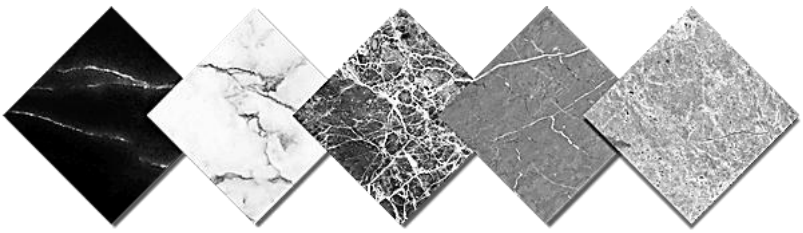
i) (Electrolysis, Filtration) method is used to separate a compound.

ii) A compound consists of two or more elements that can be separated (physically, chemically).

[2 marks]

[Remembering]

b) Diagram shows the tiles made from marble.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

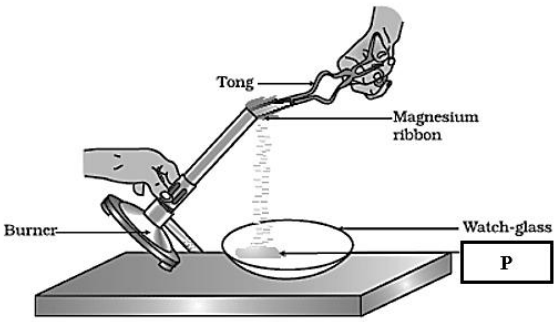
	Statements	**TRUE** or **FALSE**
(i)	Marble consists of calcium, oxygen and hydrogen.	
(ii)	The formation of natural marble requires more energy.	
(iii)	Marble consists of two or more elements that are mixed chemically.	

[2 marks]

[Understanding]

Section C (10 marks)

1. Diagram shows an activity carried out in the laboratory. Substance P is produced from the reaction.



a) Mark (√) for the correct examples of compounds.

Water	Ethanol	Coffee

[2 marks]
[Remembering]

b) State the substance P.

_____

[1mark]
[Understanding]

c) State the type of substance P produced.

_____

[1mark]
[Understandimg]

d) State two characteristics of substance P.

_____

_____

[2 marks]
[Remembering]

e) Complete the word equation below.

Magnesium + _____ → Magnesium oxide

[1 mark]
[Understanding]

f) State the changes that occur when magnesium oxide is formed.

_____

[1mark]
[Understanding]

g) State two differences between magnesium and the substance P.

_____

_____

[2 marks]
[Analysing]

A3: Assessment

1. List 3 examples of compounds in daily life.

a) _____

b) _____

c) _____

[3 marks]
[Remembering]

2. State the differences between physical change and chemical change.

Physical change	Characteristics	Chemical change
No	**Formation of new substances**	
	Properties of new substances compared to the original	Different
Less energy	**Needs energy**	
	Chemical composition (Substance and product)	Different
• Ice melting • _____ • _____	**Examples**	• Rusting of iron • _____ • _____

[8 marks]
[Understanding]

3. A metal reacts with an oxygen to form a compound called _____.

4. A metal reacts with a sulphur to form a compound called _____.

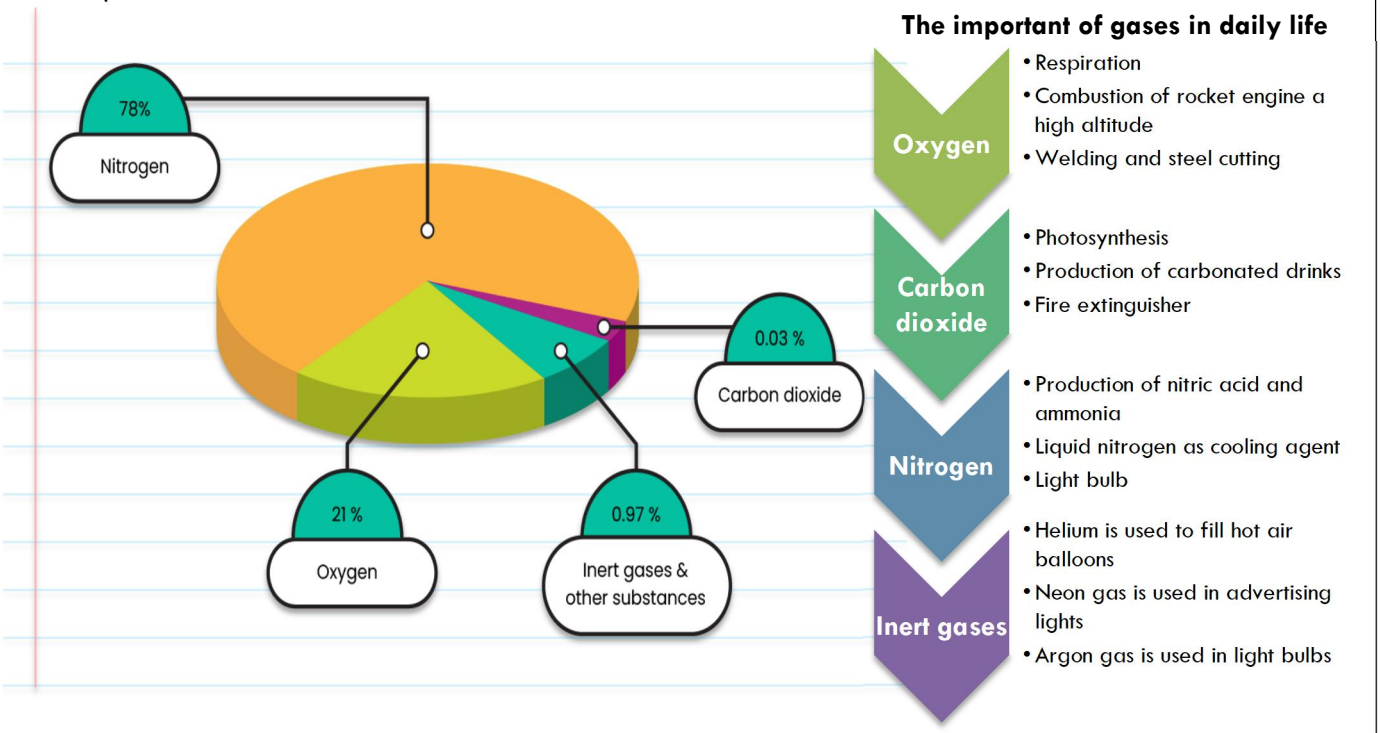
5. A _____ process can be used to separate a compound into its elements by using an electricity.

[3 marks]
[Understanding]

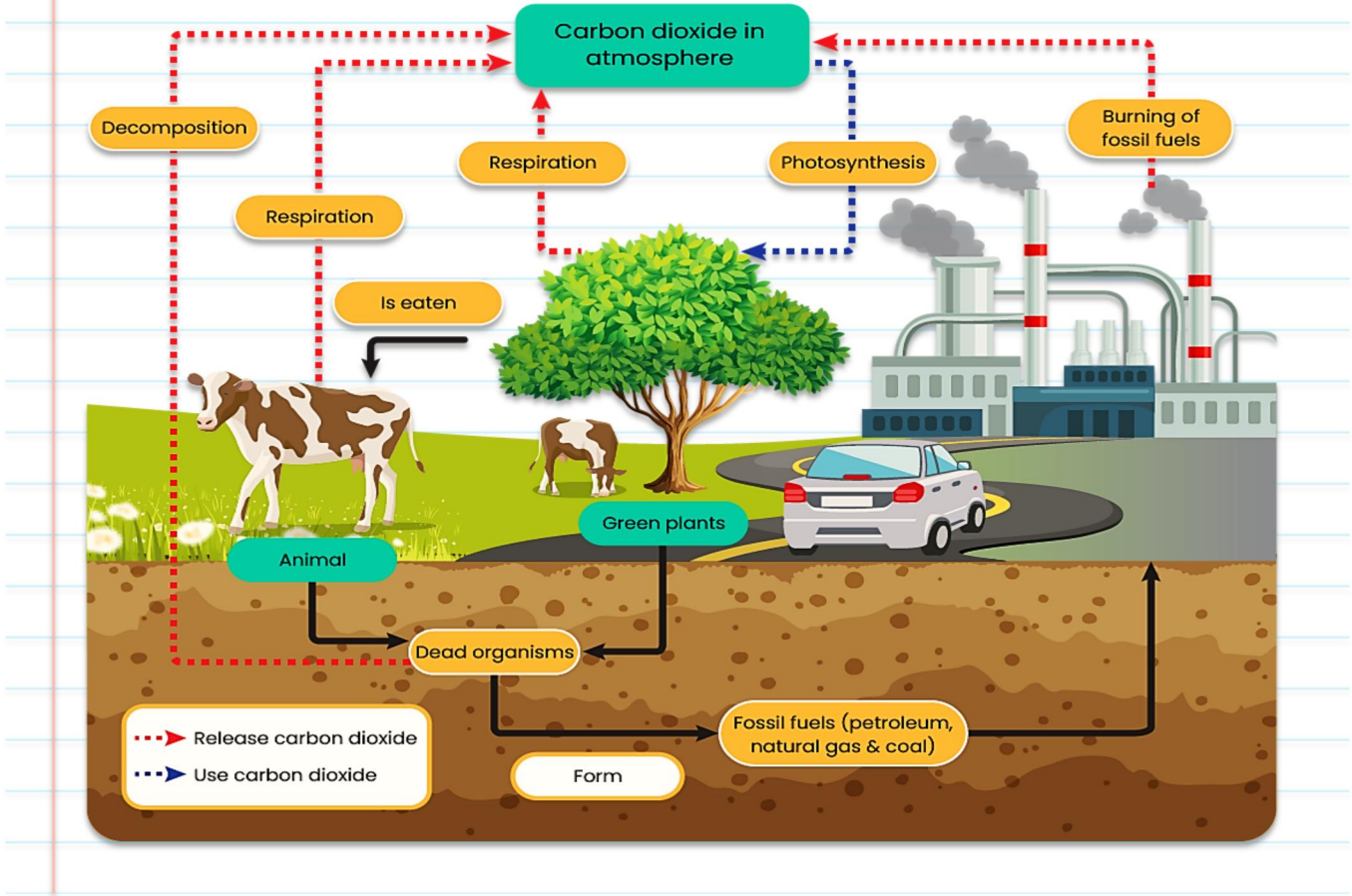
Session 12	
Learning Area	7.0 AIR
Content Standard	7.1 Composition of Air
Learning Objective	Students will be able to accomplish tasks related to the composition of air, the properties and importance of gases in air (oxygen, nitrogen, carbon dioxide and inert gases), the interpretation of data such as pie charts, and the role of the oxygen cycle and carbon cycle in maintaining a balanced composition of air.
Learning Focus	1. Composition of air. 2. Importance of gases in air. 3. Role of the oxygen cycle and carbon cycle in maintaining a balanced composition of air.
Teaching Aids	1. Smart Learning Notes (refer to A1) 2. UASA-format items Enhancement Exercises (refer to A2) • Fact/knowledge (content) • Science process skill 3. Assessment (refer to A3) 4. Answer scheme (Refer to A4)

A1: Smart Learning Notes

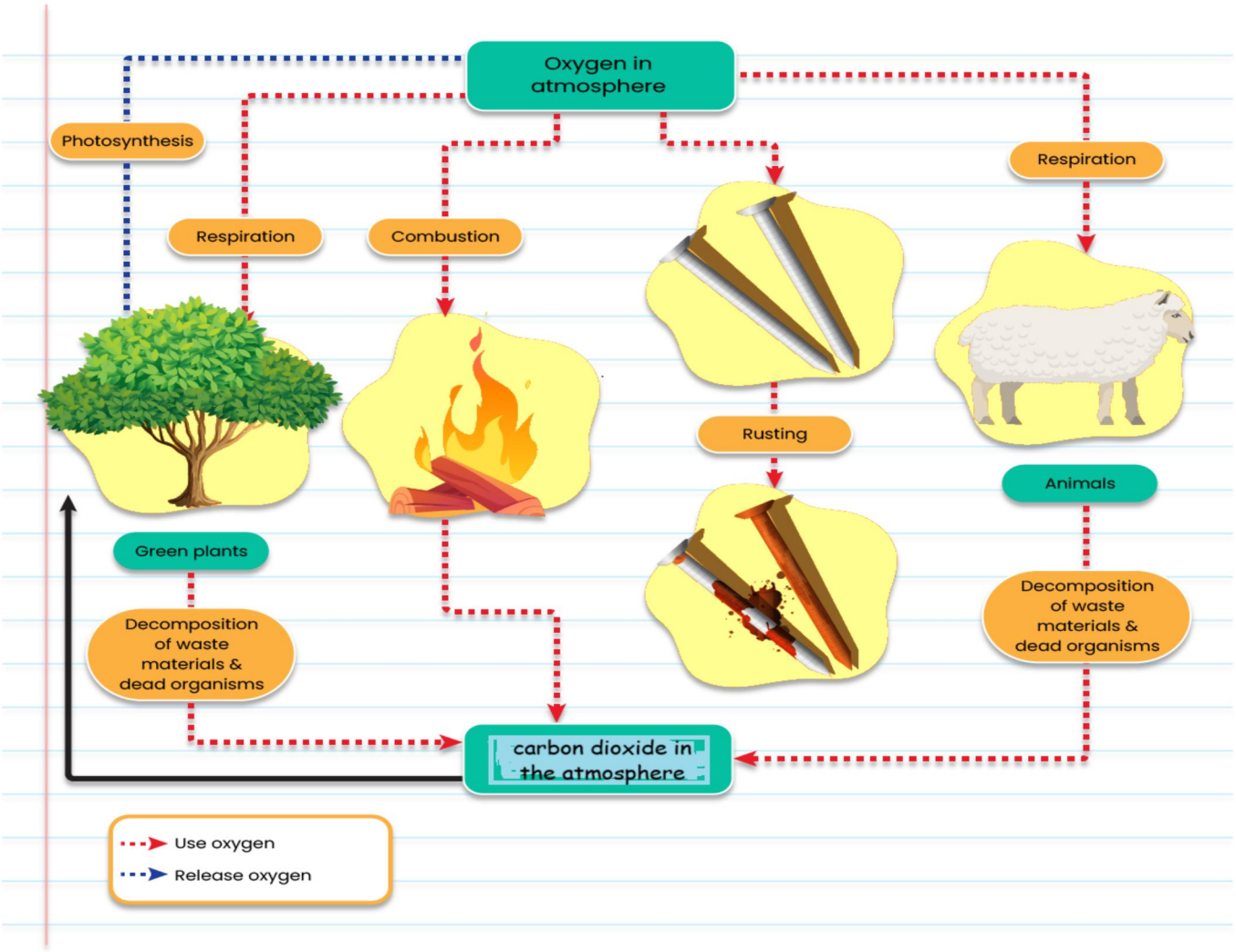
7.1 Composition of Air



Carbon cycle is the cycle that maintains the content of carbon dioxide in the air by continuously taking carbon dioxide from the air and returning it to the air



Oxygen cycle is a continuous cycle that takes oxygen from the air and returns it to the air



Ways to reduce problems of interferences to the oxygen and carbon cycle

- Prohibit illegal logging
- Avoid using excessive pesticides
- Do not burn forests
- Prevent excessive release of smoke from vehicles
- Reforestation



Source: https://app.pandai.org/note/read/kssm-sc-07-07-01/KSSM-F1-SC-07-01

A2: UASA-format items Enhancement Exercises

Section A
(5 marks)

1. Air is a mixture of several types of gases and other components. Which of the following is the content of the mixture?
   A Carbon dioxide, oxygen and inert gases
   B Microorganisms, water vapour and dust
   C Oxygen, carbon monoxide and sulphur dioxide
   D Oxygen, nitrogen, carbon dioxide, inert gases and dust

[Remembering]

2. The statement is about gas P.

Air contains 21% of gas P

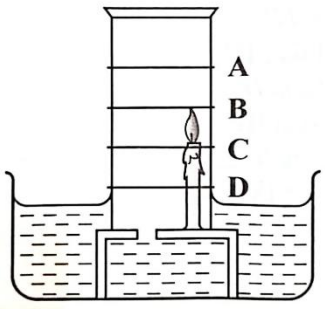
Which of the following is true about gas P?
   A Extinguishes fire
   B Supports combustion
   C Turns lime water cloudy
   D Required for photosynthesis

[Understanding]

3. Which of the following maintains the content of carbon dioxide in the air?
   A Recycle
   B Carbon cycle
   C Oxygen cycle
   D Nitrogen cycle

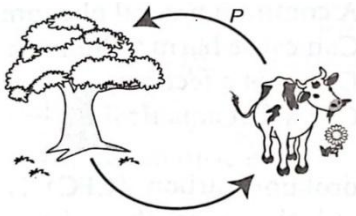
[Understanding]

4. Diagram shows an experiment to determine the percentage of oxygen in the air. Which is the water position **A, B, C, or D** when the candle goes out?



[Applying]

5. Diagram shows part of the carbon cycle.



Which of the following processes releases gas P?

I Photosynthesis
II Decomposition
III Combustion
IV Respiration

A I and II
B II and III
C I, II, and III
D II, III, and IV

[Understanding]

Section B
(20 marks)

1 (a) Diagram shows the uses of gases in our daily life.





Match the following gases with their correct functions.

	Gas		Function
(i)	Nitrogen gas	•	• Used to fill advertising lights
(ii)	Inert gases	•	• Used in the production of nitric acid and ammonia

[2 marks]
[Remembering]

(b) Write **TRUE** for the correct statements and **FALSE** for the incorrect statements about the air.

Statement	TRUE/FALSE
(i) Other components in the air are microorganisms, water vapour and dust.	
(ii) Oxygen gas forms almost 78% of the composition of air.	
(iii) Clean air has no colour or smell.	

[2 marks]
[Understanding]

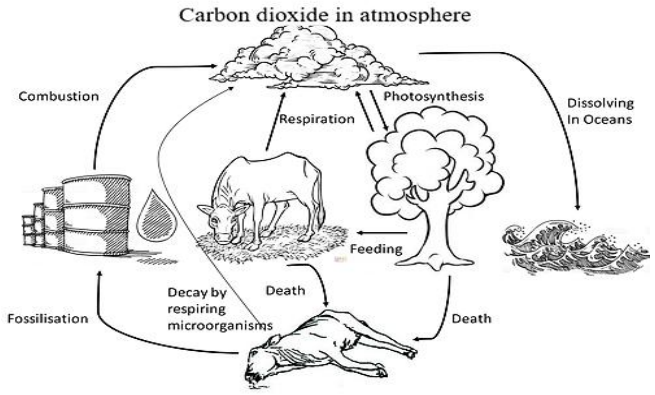
2. (a) Underline the correct answers to complete the following sentences.

(i) Burning fossil fuels that contain the element [carbon , nitrogen] release carbon dioxide gas.

(ii) The [respiration , transpirations] process performed by all animals, plants and human releases carbon dioxide gas.

[2 marks]
[Remembering]

(b) Diagram shows processes that are involved in carbon cycle.



Fill in the blanks on the carbon cycle using the words given.

Decomposition	Photosynthesis	Excretion

i)The carbon cycle begins with the intake of carbon dioxide gas by plants during ……

ii) When animals and plants die, …… will occur, which releases carbon dioxide.

[2 marks]
[Understanding]

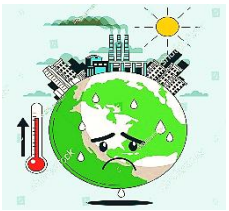
3. (a) Fill in the blank using the given words.

Global warming	Haze	The depletion of the ozone layer

The …….. is mostly caused by the emission of air pollutants, such as fumes from vehicles and factories. The use of aerosol sprays, refrigerators and air-conditioners which release CFCs (chlorofluorocarbons) result in ……

[2 marks]
[Remembering]

(b) Diagram shows the impacts if carbon cycle or oxygen cycle is disrupted.



Mark (✓) on the steps that need to be taken to avoid interferring carbon cycle and oxygen cycle.

Statement	Mark (✓)
(i) Prevent illegal logging.	
(ii) Replant trees.	
(iii) Increase the usage of vehicles powered by fossil fuel.	

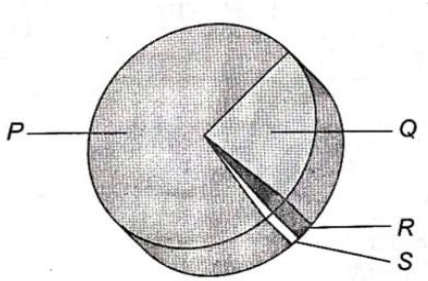
[2 marks]
[Understanding]

4. (a) Mark (✓) the importance of inert gases.

(i) Used as cooling agent.	
(ii) Used to fill weather balloons.	
(iii) Used to fill filament bulbs.	

[2 marks]
[Remembering]

(b) The pie chart represents the percentage of gases in a non-polluted atmosphere.

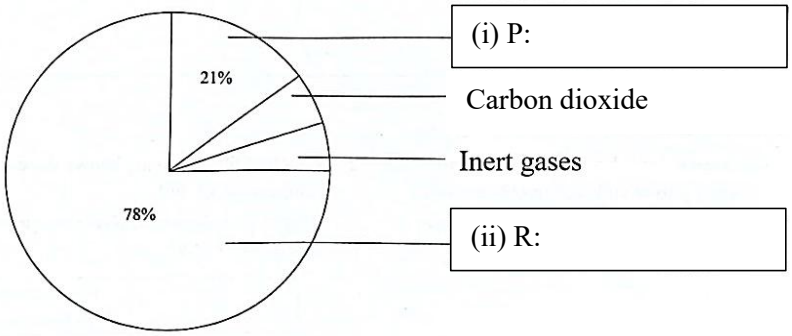


Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
(i) Living cells need gas Q To carry out respiration.	
(ii) Gas S consists of microorganisme and water vapour	
(iii) Gas R is needed by green plants during photosynthesis.	

[2 marks]
[Understanding]

5. (a) Diagram shows the composition of air.



Label the gases using the words given.

Oxygen	Argon	Nitrogen

[2 marks]
[Remembering]

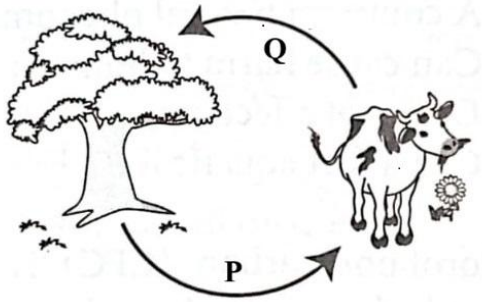
(b) Mark (✓) for the importance of Gas R.

Importance	Mark (✓)
(i) Used to produce fertiliser.	
(ii) Used as a cooling agent.	
(iii) Used for combustion.	

[2 marks]
[Understanding]

Section C
(10 marks)

1. Diagram shows two processes, P and Q, which complement each other. Process P releases oxygen, while process Q releases carbon dioxide.



(a) State the processes P and Q.

(i) P: _____

(ii) Q: _____

[2 marks]
[Remembering]

(b) What is the importance of process P to other organisms?

_____

[1 mark]
[Understanding]

(c) Explain how grass and cows depend on each other.

_____

_____

[2 marks]
[Understanding]

(d) A construction site has opened near this area. A lot of dust and debris are produced by the activity. Explain how this situation affects process P.

_____

_____

_____

[3 marks]
[Analysing]

(e) Suggest two ways humans can reduce the effects of the activity in 1(d) on process P.

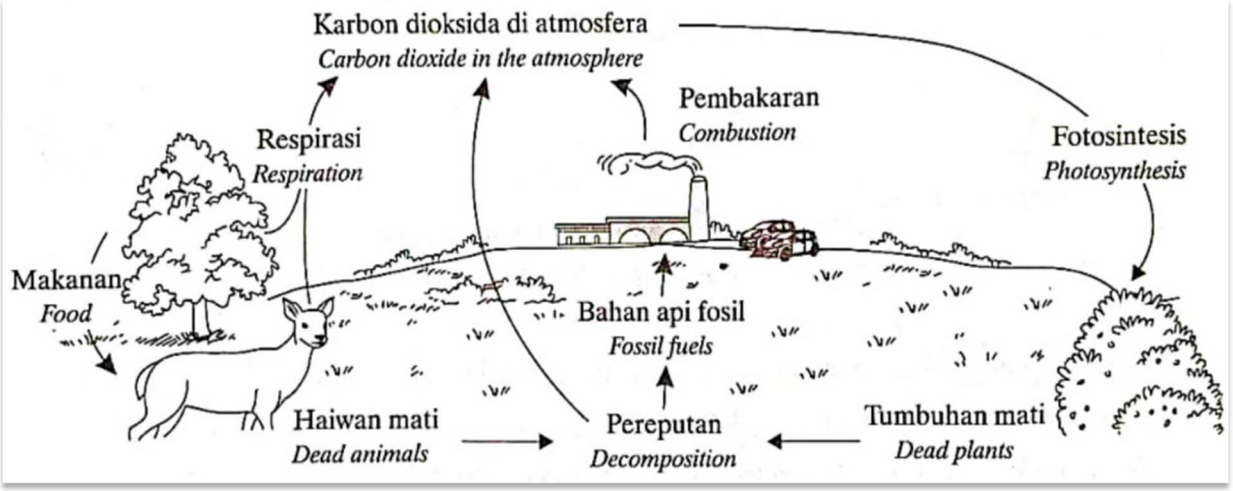
_____

_____

[2 marks]
[Applying]

A3: Assessment

1. With the aid of the diagram below, complete the process in carbon cycle.



(a) Carbon in the form of …….. in atmosphere is used by plants to make food through the process of ……

(b) Animals then obtained …….. in the form of carbon compounds from other plant.

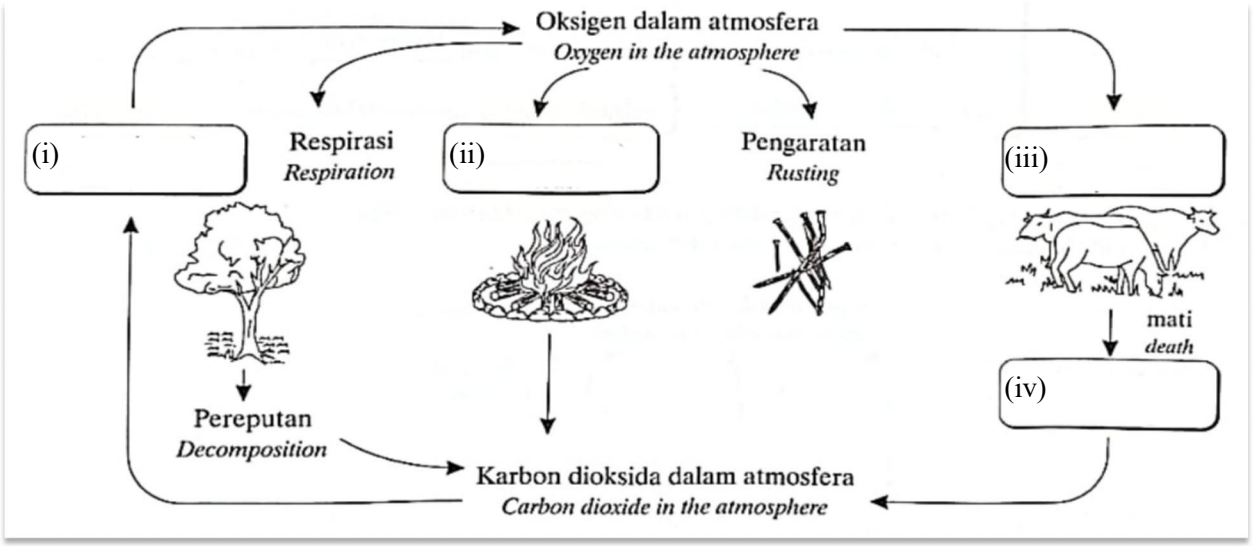
(c) Carbon is returned to the atmosphere in the form of carbon dioxide when plants and animals carry out the process of …….. or die and undergo ……

(d) Carbon is also returned to the atmosphere through the process of …….

(e) These processes such as decomposition, combustion and respiration are ……. by photosynthesis.

2. Complete the diagram and process below regarding oxygen cycle.

Photosynthesis	Bacteria	Requires	Plants
Released	Respiration	Combustion	Decaying



(a) …….. is a ……. cycle that take oxygen from the air and returns it to the air.

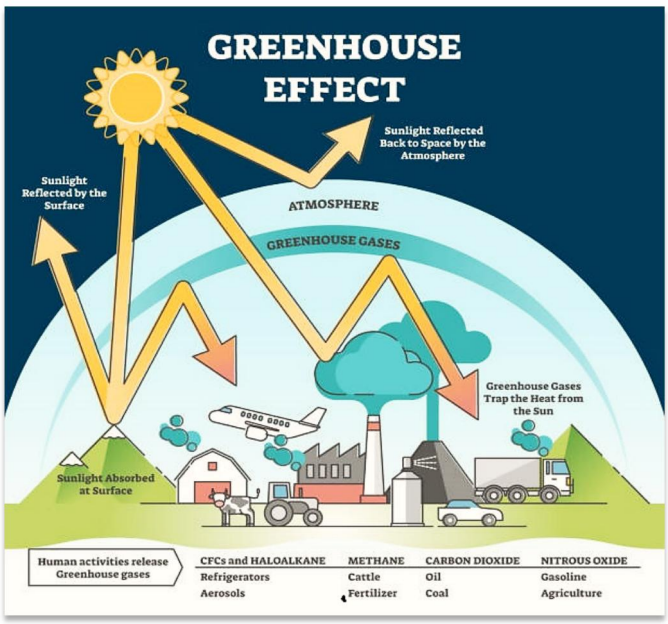
(b) Oxygen cycle occurs through the processes of rusting, ……., ……..., …….. and ……..

(c) During photosynthesis process, oxygen is ……

(d) Oxygen is used during the combustion process, respiration process by ……. and animal as well as decomposition process by …… and fungi.

(e) The rusting process also …….. oxygen to happen.

3. As a student, what can you do to reduce the greenhouse effect?



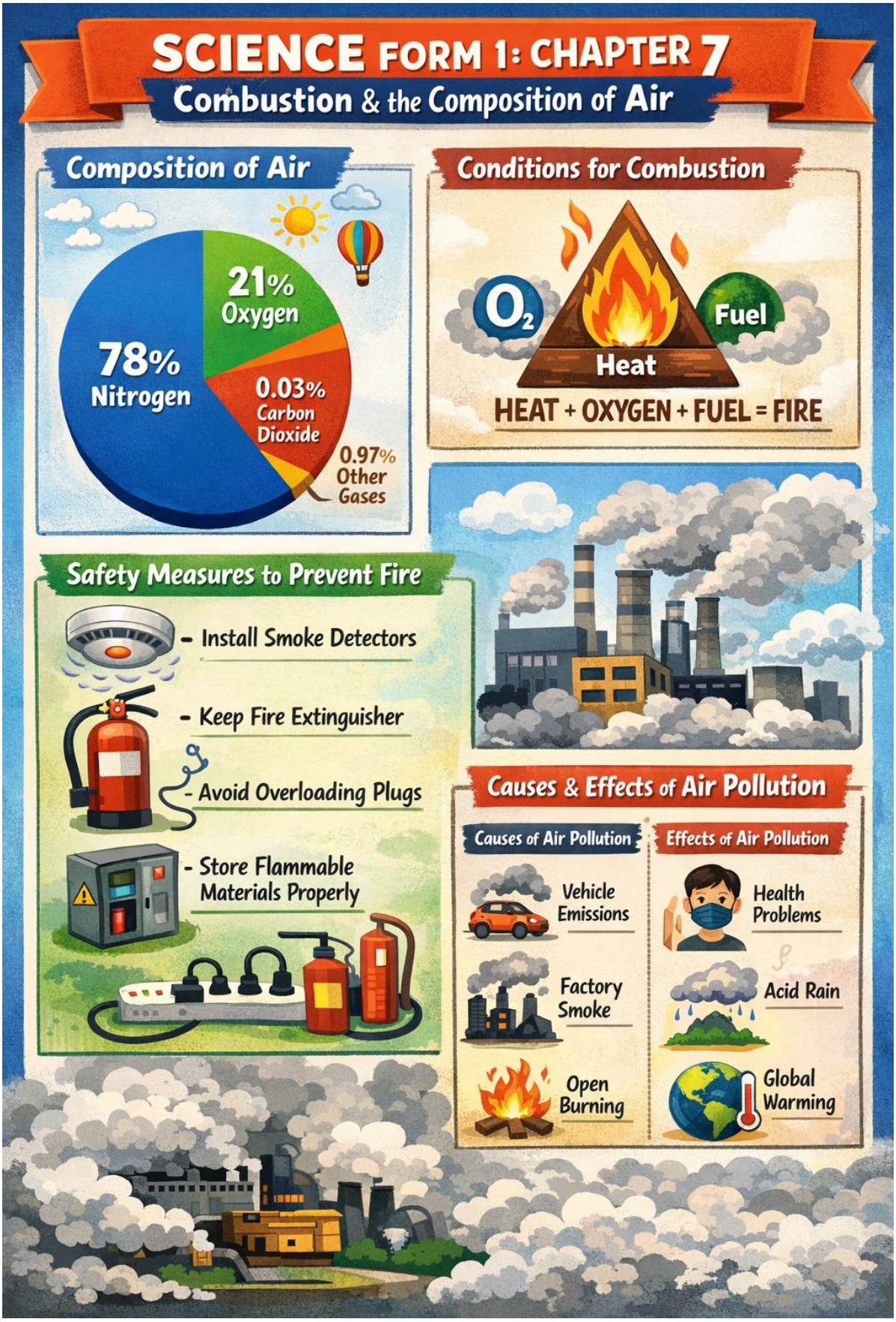
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_____

_____

Session 13	
Learning Area	7.0 Air
Content Standard	7.2 Combustion 7.3 Air Pollution
Learning Objective	Students will be able to accomplish the tasks regarding the conditions of combustion, causes and ways to prevent air pollution.
Learning Focus	1. Conditions needed for combustion and manufacture of fire extinguisher 2. Air pollution, the causes and steps to control air pollution.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) • Fact/knowledge (content) • Science process skill 3. Assessment (Refer to A3) 4. Answer scheme (Refer to A4)

A1: Smart Learning Notes



A2: UASA-format items Enhancement Exercise
Section A (5 marks)

1. Which of the following gas is needed for combustion to occur? [Remembering]

A Oxygen
B Nitrogen
C Inert gas
D Carbon dioxide

2. Diagram shows a fire extinguisher.



Which are correct sources of fire that can be extinguished by this fire extinguisher? [Understanding]

	Material on fire	Example
A	Gas	Butane
B	Metal	Potassium
C	Solid	Wood
D	Liquid	Varnish

3. Which of the following is the safety measure to prevent the occurrence of fire? [Understanding]

A Keep flammable substances away from the fire.
B Throw cigarette away when they are still burning.
C Keep matches and lighter on the ground so they are easy to reach.
D Plugging many electrical appliances to a single electrical source can save electric energy.

4. Which of the following gases can cause acid rain? [Remembering]

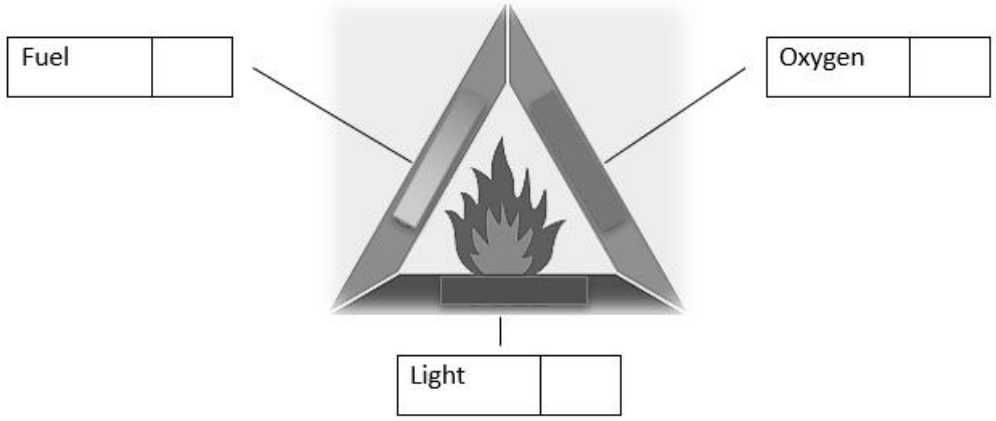
A Sulphur dioxide
B Carbon dioxide
C Carbon monoxide
D Chlorofluorocarbon

5. Which of the following is the step in controlling air pollution? [Understanding]

A Use leaded petrol
B Encourages open burning
C Bans smoking in public areas
D Allow factories to be built in housing areas

Section B
(20 marks)

1. a) Mark (√) the correct combustion conditions in the diagram below.



[2 marks]
[Remembering]

b) Diagram shows a fire fighter extinguishing the source of fire.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Burning of wood can be extinguished by using water.	
ii) Oxygen is needed to remove the carbon dioxide that cause the combustion.	
iii) Water spray is used to reduce the temperature of burning materials.	

[2 marks]
[Understanding]

2. a) Diagram shows a fire extinguisher.



Circle the materials that can be extinguished using this fire extinguisher.

Wood	Oil	Propane

[2 marks]
[Remembering]

b) Diagram shows a house on fire.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE or FALSE**
i) Installs fire alarm and smoke detector at home.	
ii) Plugging in many electrical appliances to a single electrical source.	
iii) Keep matches and lighters in a safe place.	

[2 marks]
[Understanding]

3. a) Underline the correct answers.

i) (Carbon dioxide / chlorofluorocarbon) is widely used as a cooling agent in refrigerator.

ii) Smoke from factories, vehicles and open burning lead to (haze / acid rain).

[2 marks]
[Remembering]

b) Diagram shows the used of pesticide in agriculture.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	TRUE or FALSE
i) Educate students by organizing free-pesticides campaigns.	
ii) Allow farmers to use pesticides widely in their farm.	
iii) Use organic substances instead of chemical substances such as pesticides.	

[2 marks]
[Understanding]

4. a) Match each pollutant to its effect.

Pollutant	Effect
(i) Nitrogen dioxide	Acid rain
(ii) Chlorofluorocarbon	Greenhouse effect
	Thinning of the ozone layer

[2 marks]
[Remembering]

b) Diagram shows a situation in a city.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statements	**TRUE** or **FALSE**
(i)	The factories help to clean the air by releasing fresh oxygen.	
(ii)	Vehicle exhaust increases air pollution in the city.	
(iii)	Practising the use of public transport or carpooling reduces air pollution.	

[2 marks]
[Understanding]

5. a) Match the correct techniques of combustions with its example.

Technique	**Example**
(i) Cooling	Close the source of gas supply
(ii) Covering	Cover the fuel surface with sand
	Sprinkle water on the surface of the burning material

[2 marks]
[Remembering]

b) Diagram shows haze in Kuala Lumpur.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statement	TRUE or FALSE
(i)	Smoke from vehicles and factories in big cities can cause haze.	
(ii)	Haze reduces the rate of photosynthesis.	
(iii)	Haze causes clear vision for the road users.	

[2 marks]
[Understanding]

Section C (10 marks)

1 (a) Diagram shows a condition in an industrial area.



Based on the diagram above, mark (✓) type of pollution.

Air pollution		Sound pollution	

[1 mark]

(b) State two examples of air pollutants that cause the pollution in (a).

_____

_____

[2 marks]

(c) Explain one effect of the pollution on human health.

_____

_____

[2 marks]

(d) Diagram shows a condition on a busy road.



Explain another human activity that contributes to the condition in the diagram.

_____

_____

[2 marks]

(e) State three ways to prevent and control air pollution in education.

_____

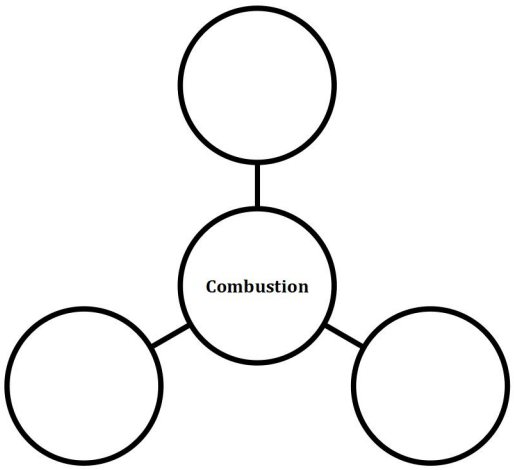
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[3 marks]

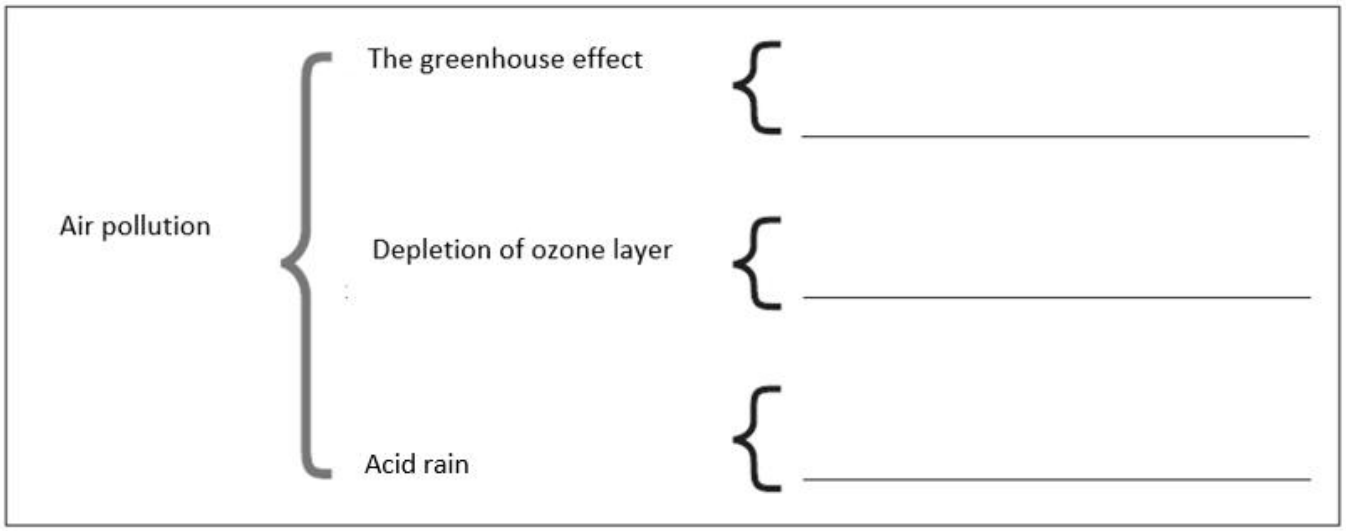
A3: Assessment (6 marks)

1. Complete the bubble map below with the conditions needed for combustion.



[3 marks]
[Remembering]

2. Complete the brace map with the gases that cause the following effects of air pollution.



[3 marks]
[Remembering]

Session 14	
Learning Area	8.0 Lights and Optic
Content Standard	8.1 Usage of mirrors 8.2 Characteristics of light 8.3 Reflection of light
Learning Objective	Students will be able to accomplish the tasks regarding usage of mirrors, characteristics of light and reflection of light
Learning Focus	1. Type of image 2. Type of mirrors and their characteristics of imaged form 3. Application of mirrors in daily life 4. Properties of light 5. Law of reflection 6. Application of reflection of light in daily life
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. Technique of answering. (Refer to A2). 3. UASA format items Enhancement Exercises (Refer to A3) • Fact/knowledge (content) • Science process skills 4. Assessment (Refer to A4) 5. Answer scheme (Refer to A5)

A1: ***Smart Learning Notes***

Jenis-jenis Imej/*Types of Image*

1. Imej sahih (nyata) ialah imej yang terbentuk pada skrin.
   A real image is an image that forms on a screen.
2. Imej maya ialah imej yang tidak dapat terbentuk pada skrin.
   A virtual image is an image that cannot be formed on a screen.

Jenis-jenis Imej dan Cirinya/*Types of Images and Their Characteristics*

Imej pada cermin satah
Image on a plane mirror



Maya, tegak, sama saiz
Virtual, upright, same size

Imej pada cermin cekung
Image on a concave mirror



Maya, tegak dan lebih besar
Virtual, upright and bigger

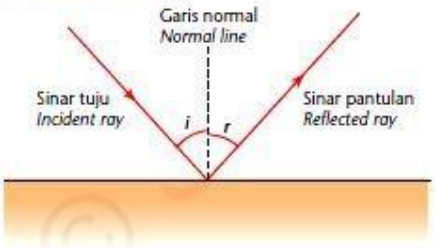
Imej pada cermin cembung
Image on a convex mirror



Maya, tegak dan lebih kecil
Virtual, upright and smaller

Pantulan Cahaya dan Aplikasinya dalam Kehidupan Harian
Reflection of Light and its Application in Daily Life

1. Pantulan cahaya adalah lantunan cahaya dari suatu permukaan legap apabila cahaya jatuh padanya.
   Reflection of light is the bouncing of light from an opaque surface when the light falls on it.

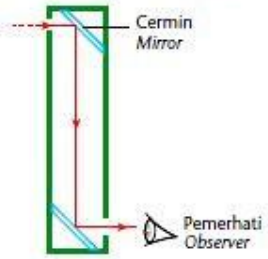


Menurut Hukum Pantulan,
According to the Law of Reflection,

(a) sinar tuju, sinar pantulan dan garis normal semuanya berada pada satah yang sama.
the incident ray, the reflected ray and the normal line all lie on the same plane.

(b) sudut tuju adalah sama dengan sudut pantulan.
the angle of incidence is equal to the angle of reflection.

2. Periskop digunakan pada kapal selam.
   Periscope is used in submarines.



3. Pantulan cahaya dalam kaleidoskop menghasilkan corak yang cantik.
   Reflection of light in kaleidoscope produces beautiful patterns.



4. Papan tanda, pemantul mata jalan dan jaket keselamatan memantulkan cahaya pada waktu malam.
   Sign boards, reflective road studs and safety jackets reflect light at night.



Beberapa aplikasi pantulan cahaya dalam kehidupan
Some applications of reflection of light in life

Source: Buku Nota Bestari Sasbadi

A2: Technique of answering

Science Process Skills
Example:

Diagram shows apparatus set-up to study a response in seedling.



(a) State the observation of this experiment.
The shoot of the seedling grows towards light.

What can be observed in the diagram after 3 days?

[1 mark]
[Observing]

(b) State the inference based on the observation at (a).
The shoot of the seedling grows towards light because the shoots response towards light.

Inference: Observation + Explanation to the observation

[1 mark]
[Making inference]

(c) Identify the variables for the experiment.

(i) Manipulated variable
Position of direction of light

(ii) Responding variable
Direction of growth of shoot of the seedlings

(iii) Constant variable
Presence of water/height and type of the seedlings

Manipulated variable:
Aspect/factor that is purposely changed on apparatus
Responding variable:
Aspect/factor that is observed and recorded
Constant variable:
Aspect/factor that is unchanged/remained

[3 marks]
[Controlling the variables]

(d) State one precautionary step that need to be taken when conducting this experiment.
Height and type of the seedlings are the same

Refer to the constant variable

[1 marks]
[Experimenting]

(e) State the operational definition of positive phototropism.
Positive phototropism is the growth of seedling towards the light when the seedling is placed in a box with a hole at the side.

Operational definition: Observation + Condition/steps taken to produce the observation

(f) State the conclusion of this experiment.
(i) Shoot of the seedling shows **positive phototropism**
(ii) Root of the seedling shows **negative phototropism**

Refer to Hypothesis
- shows the relationship between manipulated variables and responding variables

[2 marks]
[Making conclusion]

Sumber: PDP Sains Tingkatan 3, Ilmu Bakti

A3: UASA-format items Enhancement Exercise
Section A (5 marks)

1. What is a virtual image?
   A. An image that is always upside down
   B. An image where light rays actually meet
   C. An image that can be captured on a screen
   D. An image where light rays only appear to come from a point

[Remembering]

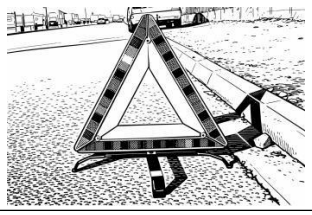
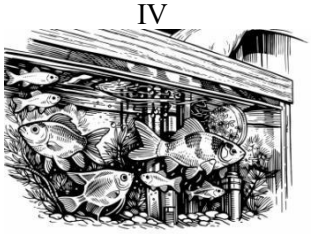
2. Which of the following optical instruments works mainly by using the reflection of light?
   A. Periscope
   B. Eyeglasses
   C. Microscope
   D. Magnifying glass

[Remembering]

3. Which of the following statements about light is **CORRECT**?
   A. Light cannot travel through a vacuum.
   B. Light can be blocked by an opaque object to form shadow.
   C. The angle of incidence is always equal to the angle of reflection.
   D. Reflection occur when light travels from a denser medium into a less dense medium.

[Remembering]

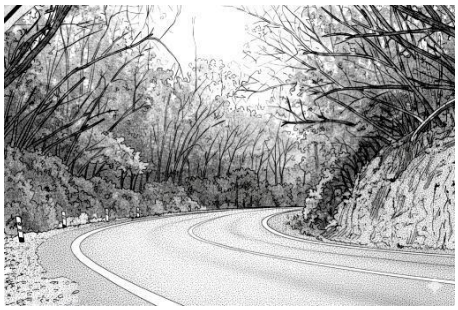
4. Choose the correct applications of reflection of light in daily life.

I	II	III	IV
			

A. I and II B. III and IV C. II and III D. I and IV

[Understanding]

5. Diagram shows a dangerous sharp corner.



Suggest a way to avoid accident occur at the sharp corner.
A. Place a plane mirror.
B. Place a convex mirror.
C. Place a concave mirror.
D. Place a plane mirror and convex mirror.

[Applying]

Section B (20 marks)

1. (a) Complete the table with correct answers by using the words given.

Laterally inverted	Real	Virtual

Type of mirror	Image characteristics		
Plane			Same size

[2 marks]
[Remembering]

(b) Diagram shows an application of mirror.



Mark ( ) on the correct statements about the mirror.

STATEMENT	Mark ( )
It is plane mirror.	
Used to magnify image.	
Dentists use to view enlarged patients' teeth.	

[2 marks]
[Understanding]

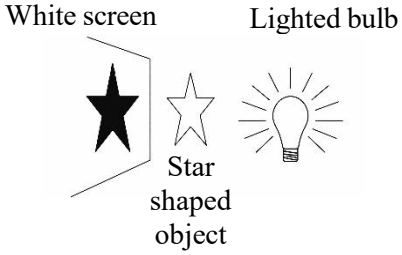
2. (a) Fill in the blanks with correct answers by using the words given.

opaque	black	straight line

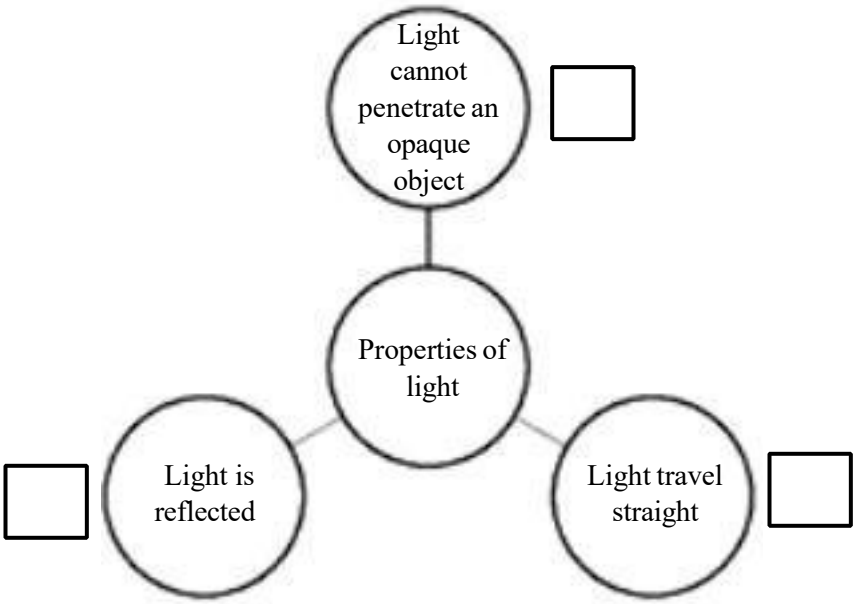
Light travels in a _____. The light is blocked by an _____ object can form a shadow.

[2 marks]
[Remembering]

(b) Diagram shows a shadow formed on wall.



Based on the diagram, mark **( )** the correct properties of light involved in the box provided.



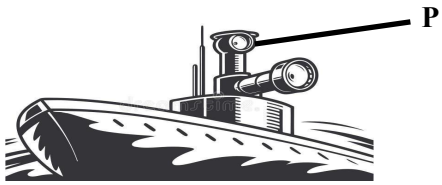
[2 marks]
[Understanding]

3. (a) Circle the correct statements about the Law of reflection.

Law of reflection		
The angle of incidence, *i* is equal to the angle of reflection, *r*.	The light is reflected at 45°.	The incident ray, the reflected ray, and the normal line all lie on the same plane.

[2 marks]
[Remembering]

(b) Diagram shows a submarine with an instrument P.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements about the intrument P.

STATEMENT	**TRUE or FALSE**
It is a kaleidoscope.	
It is applying reflection of light.	
Image formed from P is same size with object, upright and virtual.	

[2 marks]
[Understanding]

4. Diagram shows two types of mirrors on a car.



P: ……

Q: ……..

(a) Label **P** and **Q** by using the words given.

Plane mirror	Convex mirror	Concave mirror

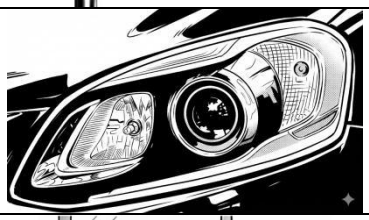
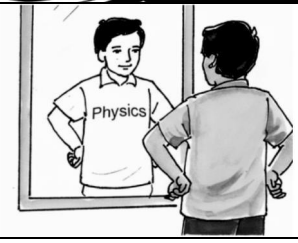
[2 marks]
[Remembering]

(b) Mark (√) on the correct statements about the mirror P and Q.

STATEMENTS	MARK (√)
Wider view can be seen from mirror P.	
Image formed by mirror Q is same size with object.	
Image formed by mirror P is bigger than object.	

[2 marks]
[Understanding]

5. (a) Match each of the following mirrors with its correct application.

Type of mirror	Application
Concave mirror	
	
Convex mirror	

[2 marks]
[Remembering]

(b) Diagram shows a toy.



Fill in the blanks by using the words given.

refraction	reflection	plane mirror

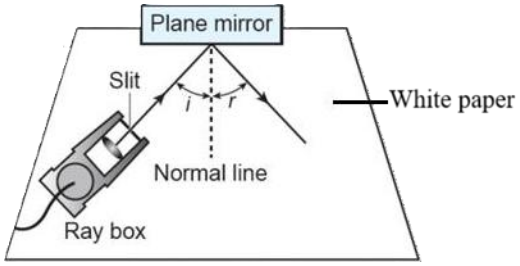
The toy made using..... This toy can create various amazing patterns.

These patterns are obtained due to the repeated..... of image of objects inside the toy.

[2 marks]
[Understanding]

Section C (8 marks)

1. Diagram shows arrangement of apparatus of an experiment to study the reflection of light.



(a) State a hypothesis for the experiment. (*Underline the correct answer*)

Angle of incidence is (smaller / same / bigger) with angle of reflection.

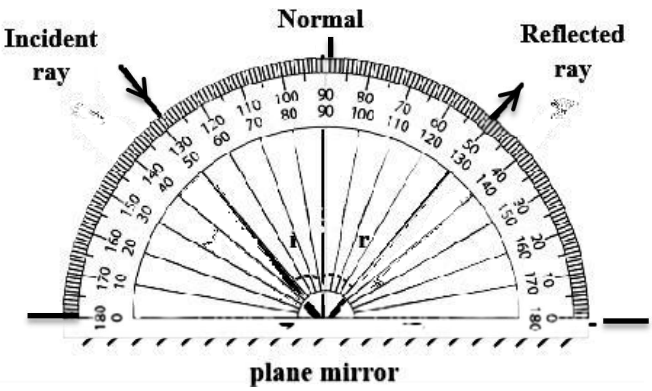
[1 mark]
[Making hypothesis]

(b) State the manipulated variable and responding variable of the experiment.

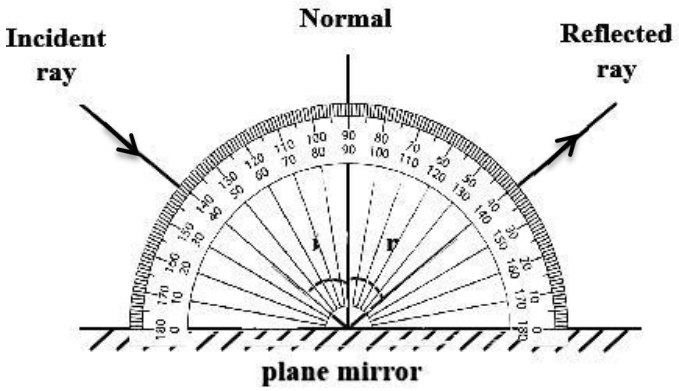
Manipulated variable	
Responding variable	

[2 marks]
[Controlling variables]

(c) Diagrams show the results for angle of reflection that obtained from the experiment when angle of incidence, $i = 40^o$ and 50^o.



Angle of incidence, $i = 40^o$



Angle of incidence, $i = 50^o$

Complete the table.

Angle of incidence, i (^{o})	Angle of reflection, r (^{o})
10	10
20	20
30	30
40	
50	

[2 marks]
[Measure and use number]

(d) State the relationship between the angle of incidence, *i* and the angle of reflection, *r*.

…..……

[1 mark]
[Interpret data]

(e) State the operational definition of reflection of light. (*Underline the correct answer*)

Reflection of light is a (process / situation / substance) to measure

(angle of incidence / angle of reflection) when a incidence ray is (directed / reflected) and

(directed / reflected) from a (concave mirror / convex mirror / plane mirror).

[1 mark]
[Operational definition]

(f) Is the experiment conducted fair? Explain.

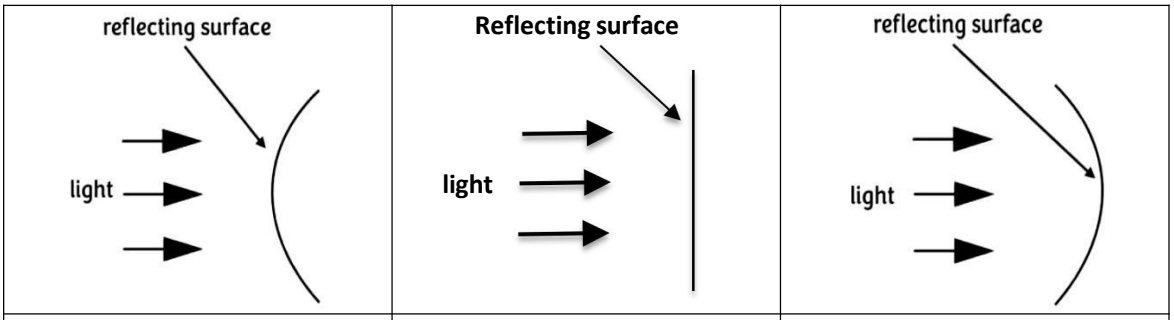
…..……

…..……..

[1 mark]
[Experimenting]

A4: Assessment (12 marks)

1. Diagram shows three types of mirrors.



P	Q	R

(a) Based on the diagram, state the concave mirror.

…….....……

[1 mark]
[Remembering]

(b) A client to an interior designer stated that the living room looks cramped.
Explain a way to be used by the interior designer to solve the problem.
Underline the correct answers.

Place a (convex mirror / concave mirror / plane mirror).

(Convex mirror / Concave mirror / Plane mirror) reflects light.

The space looks (smaller / larger).

[3 marks]
[Applying]

(c) Compare and contrast the image produced by both mirrors, J and K in the diagram.



Similarities: (*Underline the correct answer*)

Both are (real / virtual) images.

Differences: (*Aspect: Size of imag*e / *field of vision*)

……..……..

……..

…..……..

[3 marks]
[Analysing]

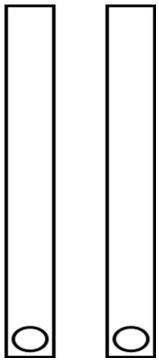
(d) Majlis Perbandaran P has installed convex mirrors on the sharp bends.
Justify the use of convex mirrors at the bends.

……

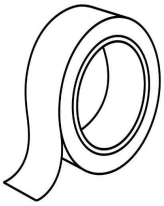
……

[2 marks]
[Evaluating]

(e) You are required to create an optical device to allow you to see the items on the high cupboard.
By using the following materials, sketch the optical device **without label** and explain how it functions.



Meter rulers with holes



Adhesive tape



Plain mirror



Glue

……..

……..

……

[3 marks]
[Creating]

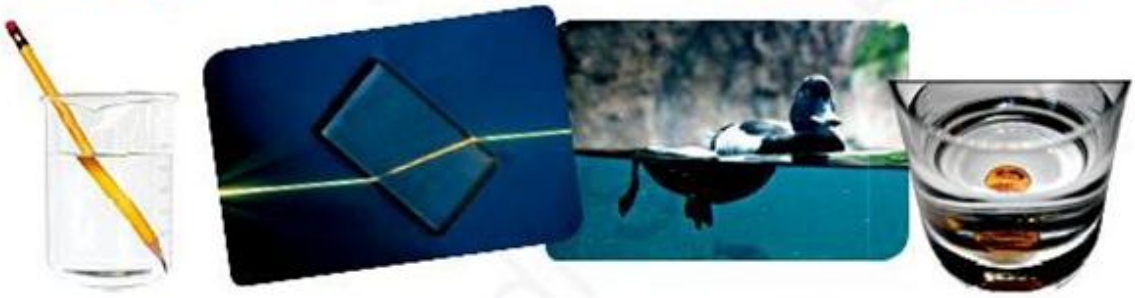
Session 15	
Learning Area	8.0 Lights and Optic
Content Standard	8.4 Refraction of light 8.5 Dispersion of light 8.6 Scattering of light
Learning Objective	Students will be able to accomplish the tasks regarding refraction, dispersion and scattering of light.
Learning Focus	1. Light is refracted when it travels through medium with different densities. 2. Relationship between angle of incidence and angle of refraction. 3. Applications of refraction in daily life. 4. Examples of dispersion of light in daily life. 5. Natural phenomena of scattering of light.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. Technique of answering. (Refer to A2). 3. UASA-format items Enhancement Exercises (Refer to A3) • Fact/knowledge (content) • Science process skills 4. Assessment (Refer to A4) 5. Answer scheme (Refer to A5)

A1: ***Smart Learning Notes***

Pembiasan Cahaya
Refraction of Light

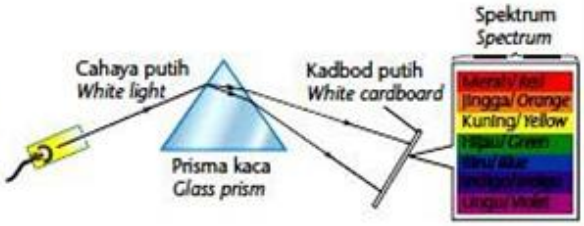
Pembiasan cahaya ialah pembengkokan cahaya apabila cahaya bergerak melalui **dua medium** yang **berbeza ketumpatan.**

Refraction of light *is the bending of light when the light travels through* ***two mediums*** *of* ***different densities.***



Gambar Rajah Sinar Pembiasan Cahaya/*Ray Diagrams of Refraction of Light*





Penyebaran Cahaya/*Dispersion of Light*

1. **Penyebaran cahaya** berlaku kerana setiap juzuk warna bergerak dengan **kelajuan** yang **berlainan** melalui prisma. Oleh sebab itu, cahaya berwarna **dibiaskan** pada **sudut** yang **berbeza.**
   Dispersion of light *occurs because each component of colour travels at* ***different speeds*** *through a prism. Therefore, the coloured lights are* ***refracted*** *at* ***different angles.***
2. Pelangi merupakan fenomena alam yang berlaku berdasarkan penyebaran cahaya.
   A rainbow is a natural phenomenon that occurs based on the dispersion of light.



Penyerakan Cahaya
Scattering of Light

Penyerakan cahaya ialah proses pemesongan cahaya berwarna dari arah asal oleh molekul udara, wap air atau zarah-zarah habuk dalam udara.

Scattering of light *is a process of deflection of coloured light from its original path by air molecules, water vapour or dust particles in the air.*





Kebiruan langit dan kemerahan langit disebabkan oleh penyerakan cahaya
The blueness and redness of sky are caused by the scattering of light

Source: Buku Nota Bestari Sasbadi

A2: Technique of answering

Science Process Skills
Example:

Diagram shows apparatus set-up to study a response in seedling.



(a) State the observation of this experiment.
The shoot of the seedling grows towards light.

What can be observed in the diagram after 3 days?

[1 mark]
[Observing]

(b) State the inference based on the observation at (a).
The shoot of the seedling grows towards light because the shoots response towards light.

Inference: Observation + Explanation to the observation

[1 mark]
[Making inference]

(c) Identify the variables for the experiment.
(i) Manipulated variable
Position of direction of light

(ii) Responding variable
Direction of growth of shoot of the seedlings

(iii) Constant variable
Presence of water/height and type of the seedlings

Manipulated variable:
Aspect/factor that is purposely changed on apparatus

Responding variable:
Aspect/factor that is observed and recorded

Constant variable:
Aspect/factor that is unchanged/remained

[3 marks]
[Controlling the variables]

(d) State one precautionary step that need to be taken when conducting this experiment.
Height and type of the seedlings are the same

Refer to the constant variable

[1 marks]
[Experimenting]

(e) State the operational definition of positive phototropism.
Positive phototropism is the growth of seedling towards the light when the seedling is placed in a box with a hole at the side.

Operational definition: Observation + Condition/steps taken to produce the observation

(f) State the conclusion of this experiment.
(i) Shoot of the seedling shows **positive phototropism**
(ii) Root of the seedling shows **negative phototropism**

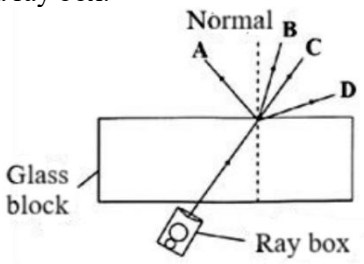
Refer to Hypothesis
- shows the relationship between manipulated variables and responding variables

[2 marks]
[Making conclusion]

Sumber: PDP Sains Tingkatan 3, Ilmu Bakti

A3: UASA-format items Enhancement Exercise
Section A (5 marks)

1. Diagram below shows a light ray from a ray box.



Which of **A, B, C** and **D** is the correct refracted ray?

[Understanding]

2. What is the most scattered colour of light in the atmosphere during midday?
   A. Red
   B. Blue
   C. White
   D. Yellow

[Remembering]

3. What is the property of light shown by the phenomenon where white light is broken into its color constituents called spectrum?
   A. Scattering
   B. Reflection
   C. Refraction
   D. Dispersion

[Remembering]

4. Diagram shows a natural phenomena.



What are the properties of light involved?
   A. Reflection and refraction
   B. Refraction and scattering
   C. Refraction and dispersion
   D. Scattering and dispersion

[Understanding]

5. Why does the sky appear blue at midday and reddish in the evening?
   A. Blue light scattered less at midday and red light scattered less in the evening.
   B. Blue light scattered most at midday and red light scattered less in the evening.
   C. Blue light scattered less at midday and red light scattered most in the evening.
   D. Blue light scattered most at midday and red light scattered more in the evening.

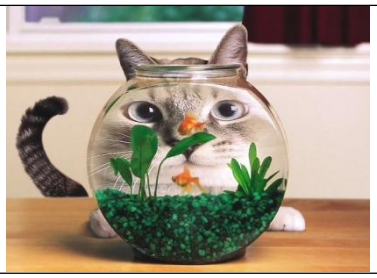
[Understanding]

Section B (20 marks)

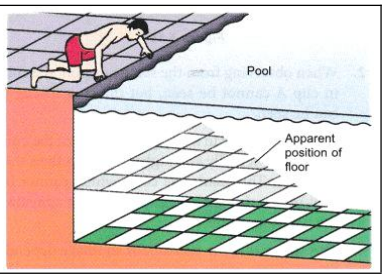
1. (a) Mark (√) on the applications in daily life regarding refraction of light.



☐



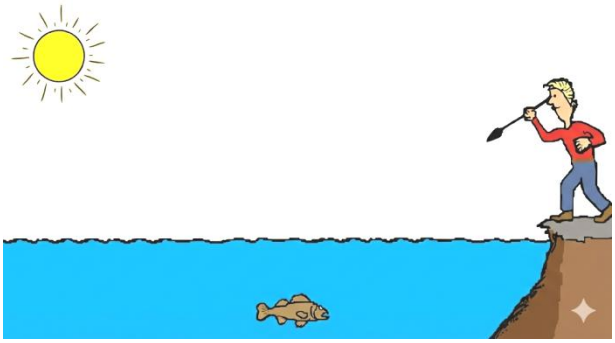
☐



☐

[2 marks]
[Remembering]

(b) Diagram shows a situation where a man uses javelin technique to catch a fish in a pond.



Write **TRUE** for the correct statement and **FALSE** for the incorrect statement regarding the situation.

STATEMENT	TRUE or FALSE
Image of fish is deeper than actual position.	
Image of fish seen deeper because of refraction of light.	
The man needs to aim deeper into the pond to reach the fish.	

[2 marks]
[Understanding]

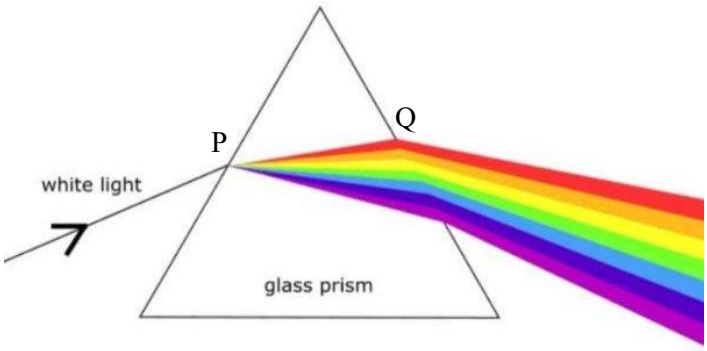
2. (a) Fill in blanks by using the words given.

atmosphere	rainbow	rain droplets

When sunlight enters the ……., the white light will be refracted and dispersed into seven different colours to form a …….

[2 marks]
[Remembering]

(b) Diagram shows a spectrum formed when white light passes through a glass prism.



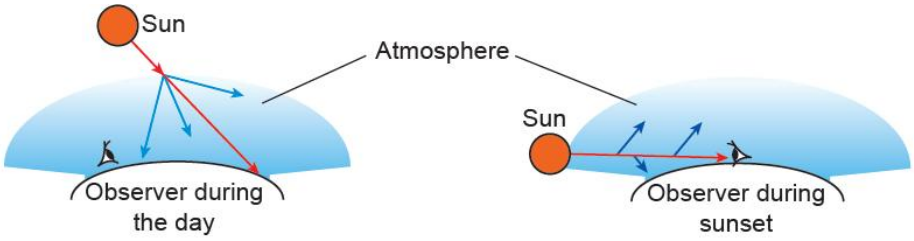
Mark (√) on the correct statements regarding the formation of spectrum.

STATEMENT	MARK (√)
Refraction of light occurs at P.	
Reflection of light occurs at Q.	
Both dispersion and refraction occur at Q.	

[2 marks]
[Understanding]

3. (a) Fill in the blanks by using the words given.

red and orange light	purple light	blue light

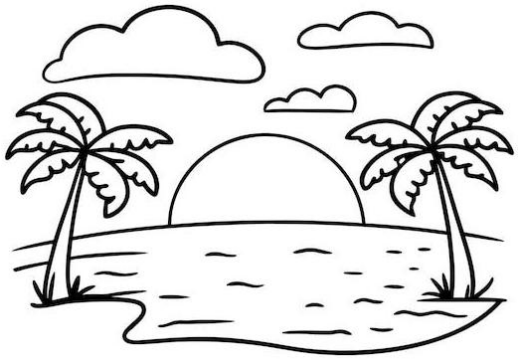


During midday, ……. scattered the most in all direction by tiny particles in the atmosphere.

During sunset, ……. less scattered will go through atmosphere to reach observer's eyes.

[2 marks]
[Remembering]

(b) Diagram shows a natural phenomenon.

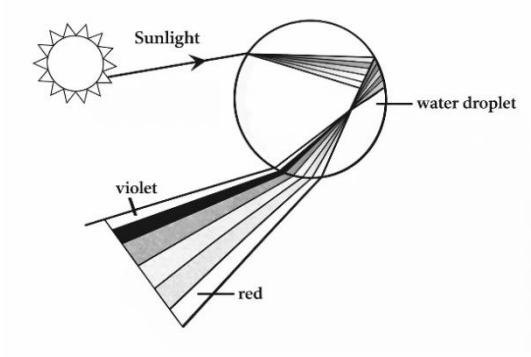


Mark (√) on the correct statements regarding the phenomenon.

STATEMENT	MARK (√)
Occurs during sunrise and sunset.	
Red light and orange light scattered less.	
Scattering and dispersion of light have occurred.	

[2 marks]
[Understanding]

4. Diagram shows the formation of a rainbow.



(a) Underline the correct words to show the formation of a rainbow.

(i) A rainbow is produced by the (scattering, dispersion) of sunlight in raindrops floating in the sky.

(ii) Raindrops act as (prisms, white light) that disperse sunlight into seven rainbow colours.

[2 marks]
[Remembering]

(b) Write **TRUE** for the correct statement and **FALSE** for the incorrect statement regarding the formation of rainbow.

STATEMENT	TRUE or FALSE
Only refraction occurs in raindrops.	
Speed of sunlight reduce in water droplet.	
Red light is most least to be refracted because it travels at highest speed.	

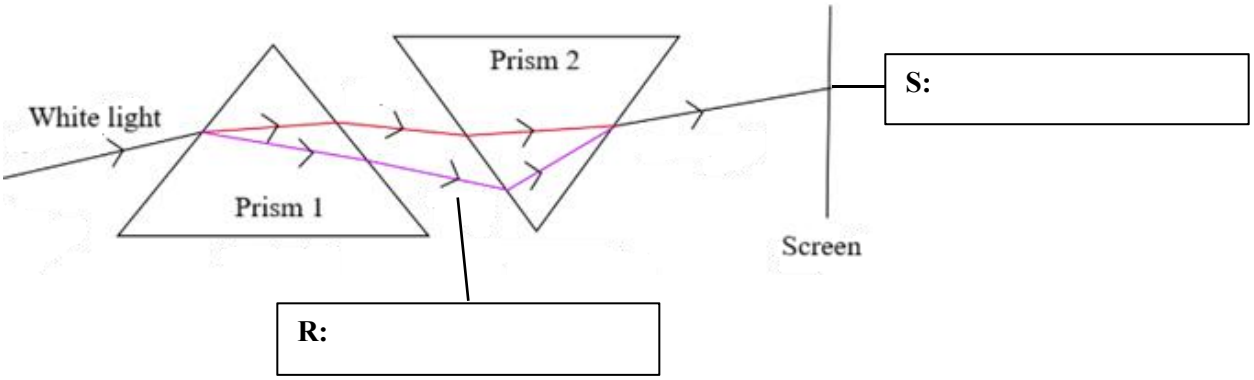
[2 marks]
[Understanding]

5. (a) Mark (√) on the correct properties of light.

PROPERTIES OF LIGHT	MARK (√)
Can scatter	
Can refract	
Cannot disperse	

[2 marks]
[Remembering]

(b) Two prisms are placed at the position as shown in the diagram.



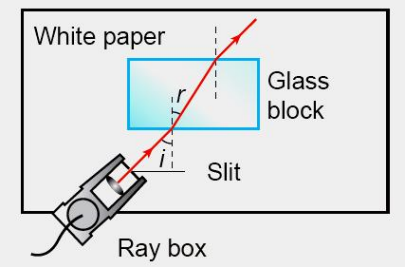
Label **R** and **S** by using the words given.

Spectrum	Rainbow	White light

[2 marks]
[Understanding]

Section C (8 marks)

1. Diagram shows arrangement of apparatus for an experiment to study the relationship of angle of incidence and angle of refraction.



(a) State a hypothesis for the experiment. (*Underline the correct answer*)

(Smaller / Greater) the angle of incidence, (smaller / greater) the angle of refraction

[1 mark]
[Making hypothesis]

(b) State the manipulated variable and responding variable of the experiment.

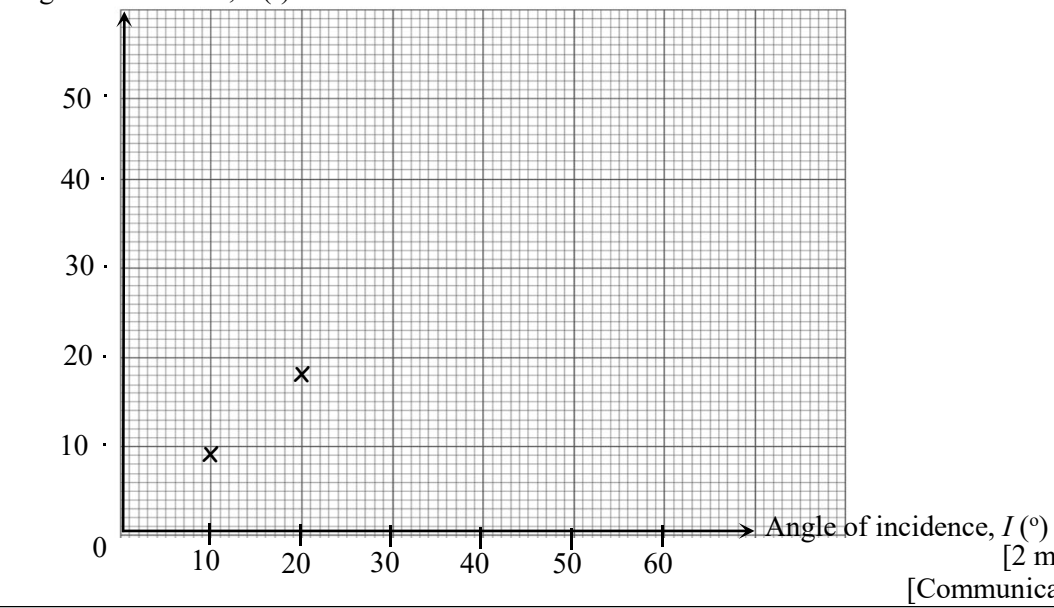
Manipulated variable	
Responding variable	

[2 marks]
[Controlling variables]

(c) Table shows the results obtained from the experiment.

Angle of incidence, i (°)	Angle of refraction, r (°)
10	9
20	18
30	27
40	36
50	45

Based on the table, draw a graph of angle of refraction, r against incidence, i in the provided graph.



[2 marks]
[Communicating]

(d) Predict the angle of refraction, r when the angle of incidence, i is 60^{o}.

…..……..

[1 mark]
[Predicting]

(e) State the operational definition of the refraction of light. (*Underline the correct answer*)

Refraction of light is a (process / situation / substance) to measure

(angle of incidence / angle of refraction) when incidence ray is placed at certain (angle / edge) and

travel through a (glass block / mirror) that is (lower / higher) density.

[1 mark]
[Operational definition]

(f) State a precautionary step that needs to be taken in the experiment. (*Underline the correct answer*)

The experiment is conducted in (bright / dark) room.

[1 mark]
[Experimenting]

A4: Assessment (10 marks)

1. Diagram shows an apparatus.



(a) State **one** of the properties of light.

……

[1 mark]
[Remembering]

(b) Mark (√) on the correct science concept involved when using the apparatus in the diagram.

Refraction		Dispersion	

[1 mark]
[Understanding]

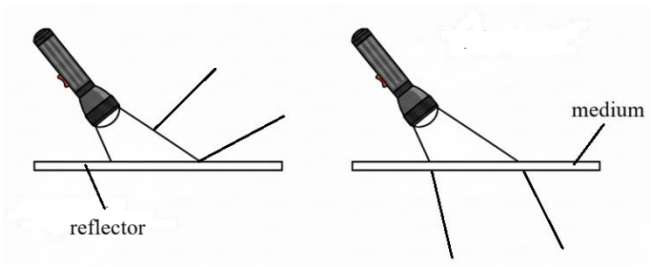
(c) An old man cannot read the newspaper because of eyes problem. Suggest **one** way to help him to view the contents of newspaper in magnified image. Explain.

…..……..

…..……..

[2 marks]
[Applying]

(d) Diagrams below show two situations, R and S.



R **S**

Compare and contrast the situations **R** and **S**.

Similarity: Both of them involved …….

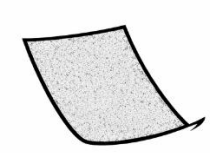
Differences: (*Light phenomenon* / *Speed of light* / *Size of angle*)

…..……

…..……

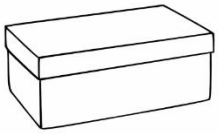
[3 marks]
[Analysing]

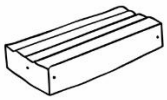
(e) A girl wants to watch a movie online with her family. Her smartphone is too small for all her family members to watch the movie.
You are asked to help her to build a projector using the materials and devices below so all her family members can watch the movie.

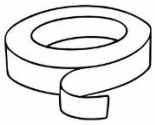

Black paper


Magnifying glass


Smart phone


Shoes box


Plasticine


Adhesive tape


Cutter

Draw the projector in the space below.

Rearrange the steps to build the projector by writing the **1, 2** and **3**.

	Cover the inside of the box with black paper so that the light is not reflected in the box
	Fix the position of the phone to get a clear image and use plasticine to place the phone in its position
	Attach the lens to the hole on the box

[3 marks]
[creating]

Session 16	
Learning Area	8.0 Lights and Optic
Content Standard	8.7 Addition of light and subtraction of light
Learning Objective	Students will be able to accomplish the tasks regarding addition and subtraction of light.
Learning Focus	1. Primary colours and secondary colours. 2. Products of addition of light. 3. Products of subtraction of light. 4. Examples of addition and subtraction of light in daily life.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) • Fact/knowledge (content) 4. Assessment (Refer to A3) 5. Answer scheme (Refer to A4)

A1: *Smart Learning Notes*

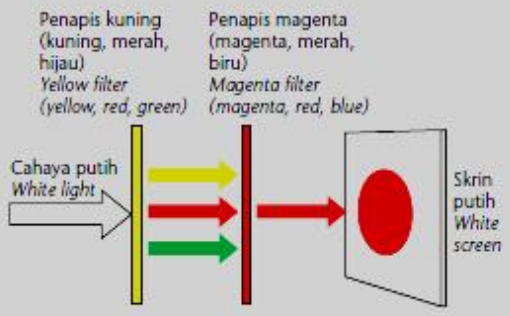
Penambahan Cahaya
The Addition of Light

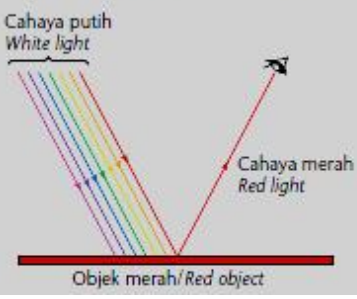
1. **Penambahan cahaya** ialah proses pencampuran warna-warna primer untuk menghasilkan warna-warna sekunder.
   *The **addition of light** is a process of mixing primary colours to produce secondary colours.*
2. **Warna primer** ialah merah, hijau dan biru.
   Primary colours are red, green and blue.
3. **Warna sekunder** ialah kuning, sian dan magenta.
   Secondary colours are yellow, cyan and magenta.



Penolakan Cahaya oleh Penapis
Subtraction of Light by Filters

1. **Penolakan cahaya** ialah proses penyerapan cahaya berwarna oleh penapis berwarna.
   Subtraction of light is a process of absorption of coloured lights by coloured filters.
2. **Penapis warna primer** membenarkan **cahaya berwarna yang sama** sahaja untuk melaluinya dan menyerap cahaya berwarna yang lain.
   Primary filters only allow the lights of the same colours to pass through and absorbs the other coloured lights.
3. **Penapis warna sekunder** membenarkan **cahaya berwarna yang sama** dan **warna primer** yang membentuk warna sekunder sahaja untuk melaluinya dan menyerap cahaya berwarna yang lain.
   Secondary filters only allow the lights of the same colours and the light of primary colours which form the secondary colours to pass through and absorbs the other coloured lights.





4. Warna bagi objek legap bergantung pada warna cahaya yang **dipantulkan ke dalam mata**.
   *The colour of an opaque object depends on the colour of the light **reflected into the eyes**.*
5. Cahaya yang sama warna dengan objek legap akan dipantulkan secara terus ke mata manakala cahaya warna yang lain akan diserap oleh objek secara penolakan.
   The light that is the same colour as the opaque objects will be reflected directly into the eyes while the light of other colours will be absorbed by the objects by subtraction.

Source: Buku Nota Bestari Sasbadi

A2: UASA-format items Enhancement Exercise
Section A (10 marks)

1. Table below shows the combination of primary colors.

Primary colour lights	Colour on the screen
Red + Blue	Magenta
Red + Green	X
Blue + Green	Cyan

What color represents X?
A. Red B. White C. Purple D. Yellow

[Remembering]

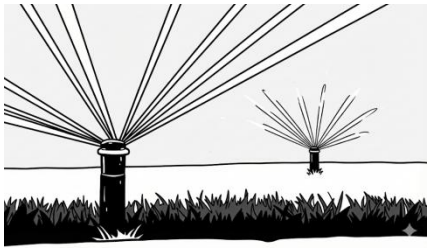
2. What are the light colours used to produce white light?
   A. Red, blue and green
   B. Red, green and yellow
   C. Blue, green and magenta
   D. Cyan, yellow and magenta

[Remembering]

3. A girl sees the rose plant in her house producing yellow flowers. What is the phenomenon that has occurred?
   A. Addition of light
   B. Scattering of light
   C. Dispersion of light
   D. Subtraction of light

[Understanding]

4. Diagram shows a sprinkler system.



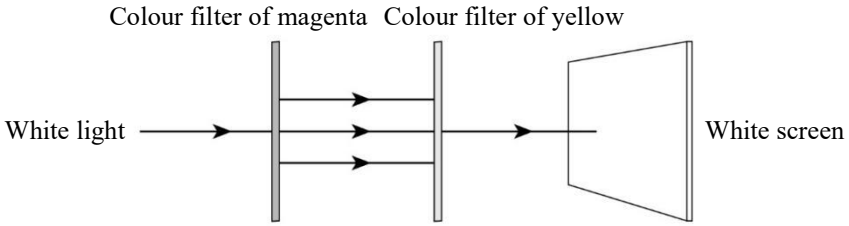
When the sprinkler system is switched on during a hot day, what colours might be seen?

I Grey II Yellow III Violet IV Orange

A. I and II B. III and IV C. II and III D. I and IV

[Understanding]

5. The diagram below shows white light passing through two colour filters.



What colour of light will form on the white screen?
A. Yellow B. Black C. Blue D. Red

[Understanding]

6. Which of the following shows the application of the addition of light in everyday life?
   A. Wearing sunglasses.
   B. Colour television screen display.
   C. Fixing tinted film on car windscreen.
   D. Fixing colour glass on the front lens of camera.

[Applying]

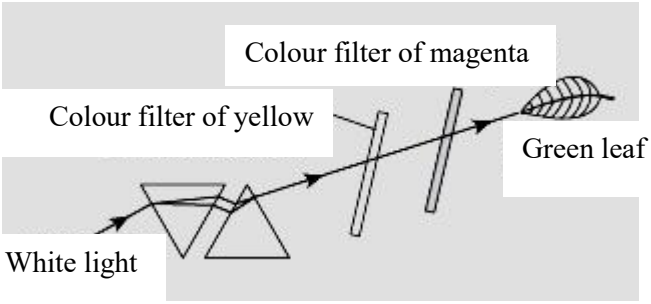
7. A green object appears black when a colour light shines on it. What is the colour of that light?
   A. White B. Yellow C. Green D. Red

[Understanding]

8. Which process causes an object to appear black?
   A. Addition of light
   B. Scattering of light
   C. Dispersion of light
   D. Subtraction of light

[Understanding]

9. The diagram below shows a white light passing through two glass prisms and two colour filters, it then shines on a green leaf.



What colour does the leaf appear to be?
A. Green B. Blue C. Red D. Black

[Understanding]

10. A man wearing a yellow shirt and blue trousers is in a room lit by green light. What are the colours of his shirt and trousers that appear under the green light?

	Shirt	Trousers
A.	Yellow	Black
B.	Green	Black
C.	Green	White
D.	Yellow	White

[Understanding]

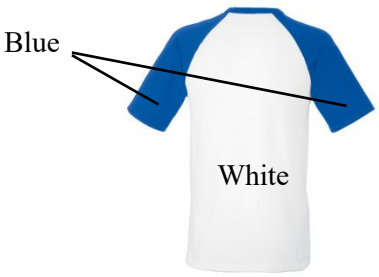
Section B (12 marks)

1. (a) Write **TRUE** for the correct statement and **FALSE** for the incorrect statement.

STATEMENT	TRUE / FALSE
Addition of light occurs when red, blue and green lights overlap.	
Addition of all three primary colours produces magenta colour.	
Primary colour is the colour that cannot be created by mixing with other colours.	

[2 marks]
[Remembering]

(b) Diagram shows a mix coloured shirt.



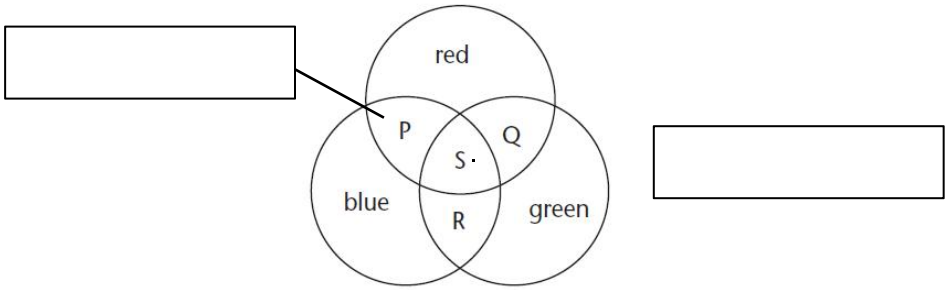
Underline the correct answers about the shirt.

(i) The white part appears white because all coloured lights are (absorbed, reflected) by it.

(ii) The blue part only reflects blue light. Other coloured lights are (absorbed, reflected) by it.

[2 marks]
[Understanding]

2. Diagram shows primary colours and secondary colours.



(a) Label **P** and **S** by using the words given.

White	Yellow	Magenta

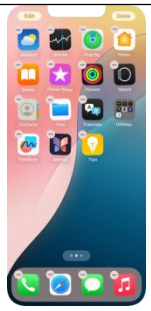
[2 marks]
[Remembering]

(b) Mark (√) on the correct statements regarding **Q** and **R**.

STATEMENT	MARK (√)
R is cyan colour.	
Q is magenta colour.	
Q and R are secondary colours.	

[2 marks]
[Understanding]

3. (a) Write correctly the examples of application in daily life with "**addition of light"** or "**subtraction of light".**

 Phone screen	 Printing	 Photography

[2 marks]
[Remembering]

(b) A basket of fruits is shown in the diagram.



Mark (√) on the correct statements about green colour and red colour.

STATEMENT	MARK (√)
Red light colour is absorbed by strawberries as opaque object.	
Green light colour is reflected into the eyes.	
Involved subtraction of colour.	

[2 marks]
[Understanding]

Section C (8 marks)

1. Diagram shows a coloured television screen.



(a) State the definition of primary colour.

……

[1 mark]
[Remembering]

(b) Mark (√) on the correct science concept applied to the diagram above.

Addition of light		Subtraction of light	

[1 mark]
[Understanding]

(c) As concert stage designer, you are required to produce multiple lights colour on stage during concert. Suggest a science concept that can be applied to produce multiple light colours. Explain.

…..……

…..……

…..……

[3 marks]
[Applying]

(d) Table shows the principle of light addition and principle of light subtraction.

Principle of light addition	Principle of light subtraction
• Colours produced from the mixing of two colours • White colour is produced when all the three primary colours are mixed together • Produced secondary colour which are cyan, yellow and magenta colours	• The colour of opaque objects depends on the colour of the light reflected into our eyes. • White objects appear white in white light because the white objects reflect all colours in white light. • Black objects appear black because they absorb all colours in white light.

Based on the table, compare and contrast the addition of light and subtraction of light.

Similarity: Both of them ……

Differences:

…..……

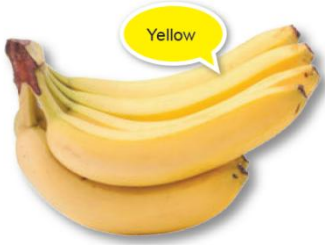
…..……

…..……

[3 marks]
[Analysing]

A3: Assessment (7 marks)

1. Diagram shows a comb of bananas.



(a) Define subtraction of light.

……

…..……

[1 mark]
[Remembering]

(b) State **one** reason yellow colour is seen on banana. Explain.

Yellow light: ……

Other colours of light: ……

[2 marks]
[Understanding]

2. Diagram shows a painting.



(a) Mark (√) on the correct example of subtraction of light.

EXAMPLE	MARK (✓)
Stage lighting	
Wall mural painting	

[1 mark]
[Remembering]

(b) State the reasons of multiple colours can been seen from the painting.

Colourful (red / yellow / blue) : ..,……..

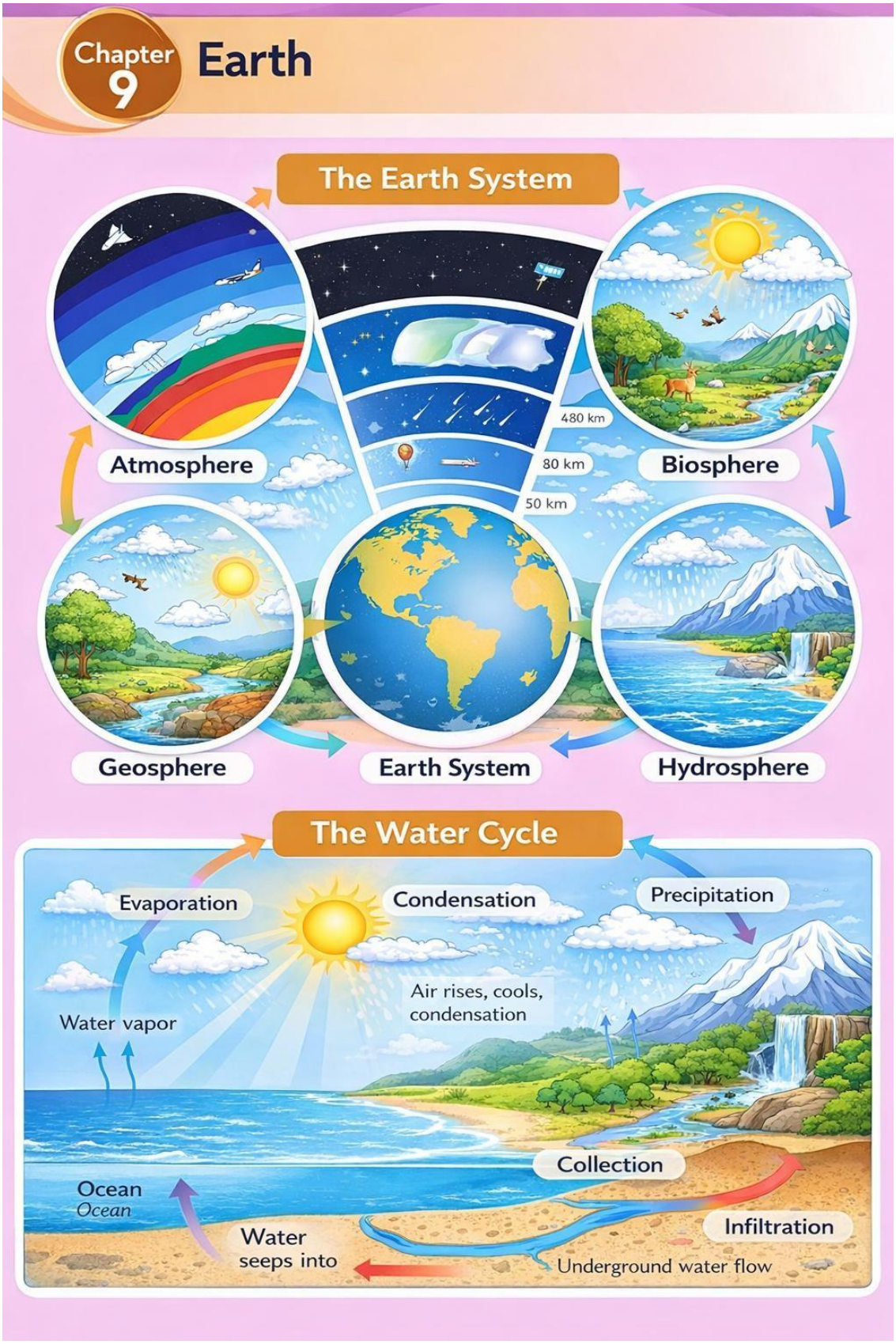
White colour: …….

Black colour: ……

[3 marks]
[Understanding]

Session 17	
Learning Area	9.0 Earth
Content Standard	9.1 System and structure of the Earth 9.2 Substances of the Earth 9.3 Main processes of the Earth
Learning Objective	Students will be able to accomplish the tasks regarding the system of the Earth, Earth layers and characteristics, types and characteristics of rocks, and communicate about exogenic and endogenic process.
Learning Focus	1. Layers of Earth 2. Characteristics of rocks 3. Endogenic and exogenic processes
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) • Fact/knowledge (content) • Science process skill 3. Assessment (Refer to A3)

A1: Smart Learning Notes



Earth Surface Processes

Endogenic & Exogenic Processes

Science Form 1 (KSSM)

ENDOGENIC Processes

Forces from Inside the Earth

Definition

Internal processes due to heat & pressure

Energy Source

Heat from Earth's Interior

Types



Volcanism - Tectonic Movenent - Earthquake

Effects

- ✓ Mountains & Volcanoes
- ✓ Earthquakes & New Landforms

Keyword: Constructive Forces

EXOGENIC Processes

Forces acting on Earth's Surface

Definition

External processes due to weather & gravity

Energy Source

Sun & Gravity

Types



Weathering Erosion Transportation

Effects

- ✓ Valleys & Beaches
- ✓ Erosion & Sediment Deposit

Keyword: Destructive Forces

ENDOGENIC vs EXOGENIC

Inside Earth	On Earth's Surface
Internal Heat	Sun & Gravity
Builds Landforms	Wears Down Landforms
Volcano	River Erosion

REMEMBER:

Endogenic = *Build Landforms*

Exogenic = *Break & Shape Landforms*

A3: UASA-format items Enhancement Exercise
Section A
(5 marks)

1. The following are the living things exist in the Earth.

- Human
- Animal
- Plant
- Microorganism

Which of the following zone consists of the living things above? [Remembering]

A Biosphere
B Geosphere
C Atmosphere
D Hydrosphere

2. Information below explains about the atmosphere layer.

Layer	Statement
P	Contains helium and hydrogen gas
Q	Phenomena of aurora occurs

What are the layers P and Q? [Understanding]

	P	Q
A	Stratosphere	Mesosphere
B	Exosphere	Thermosphere
C	Troposphere	Stratosphere
D	Mesosphere	Thermosphere

3. Diagram shows an igneous rock.



How does the rock form? [Understanding]

A Mixture of natural rocks
B Exposed to high temperature and pressure
C Cooling and solidification processes of lava
D Deposition of small particles from surrounding

4. Which of the following processes changes the surface of Earth? [Understanding]

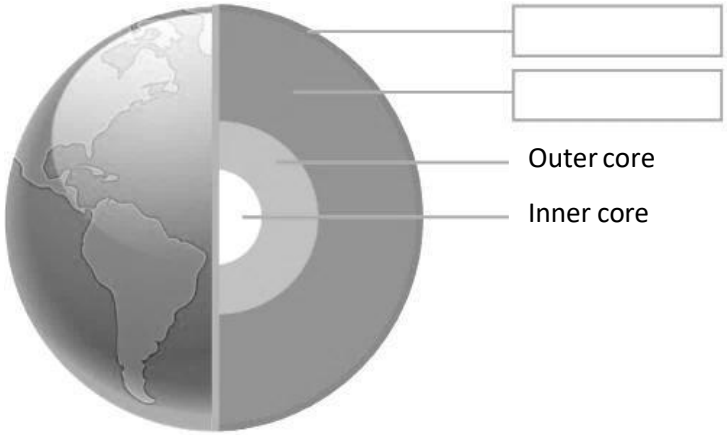
A Erosion
B Weathering
C Magma activity
D Mass depletion and ground depletion

5. Which of the following is the difference between endogenic process and exogenic process? [Understanding]

	Endogenic process	Exogenic process
A	Occurs on the Earth's surface	Occurs within the Earth
B	The Earth's external force	The Earth's internal force
C	An example is plate tectonics	An example is mass depletion
D	It is not the main process of Earth	It is the main process of Earth

Section B (20 marks)

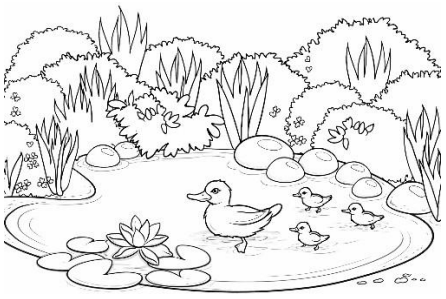
1. a) Label the main layers of the Earth.



Crust	Mesosphere	Mantle

[2 marks]
[Remembering]

b) Diagram shows one of the components on Earth.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

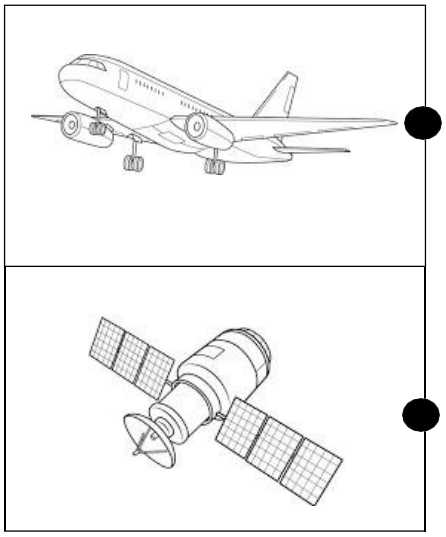
Statement	TRUE or FALSE
i) Biosphere is a component on Earth that consists of all living things.	
ii) Hydrosphere is the total amount of water on planet such as river.	
iii) The Earth consists of 3 main components which are biosphere, atmosphere, and hydrosphere.	

[2 marks]
[Understanding]

2. a) Diagram shows two objects that can travel at certain atmospheric layer.

Match the object and its atmospheric layer correctly.

Object



Atmospheric layer

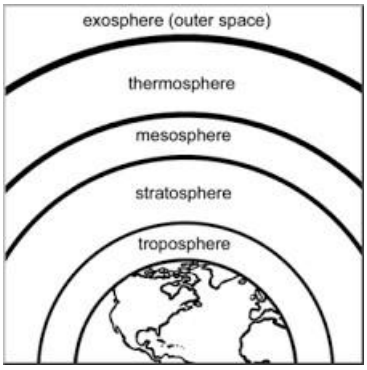
Exosphere

Thermosphere

Stratosphere

[2 marks]
[Remembering]

b) Diagram shows the layers of atmosphere.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statement	TRUE or FALSE
i) The troposphere is where all living things can breathe.	
ii) The mesosphere also known as ionosphere because contains ions that can reflect radio waves.	
iii) The stratosphere contains the ozone layer, which absorbs harmful ultraviolet radiation from the Sun.	

[2 marks]
[Understanding]

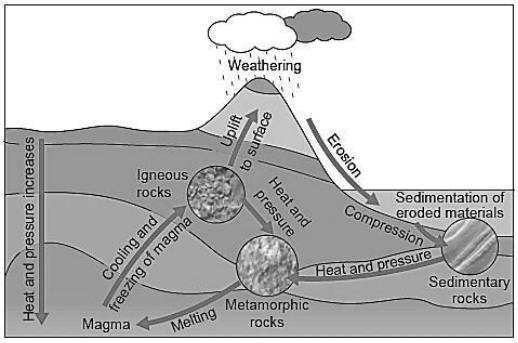
3.a) Underline the correct answers for the following statements.

i) (Igneous rocks/ sedimentary rocks) contain various minerals.

ii) (Metamorphic rocks / Sedimentary rocks) are formed when rocks are exposed to high heat and pressure without melting.

[2 marks]
[Remembering]

b) Diagram shows a rocks cycle.

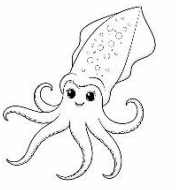
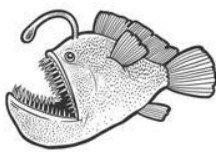


Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statement	**TRUE** or **FALSE**
i) Igneous rocks are formed when sediments are compacted and cemented.	
ii) Magma is formed when igneous rocks undergo cooling and freezing.	
iii) Sedimentary rocks are formed from sediments through the processes of erosion, sedimentation and compression.	

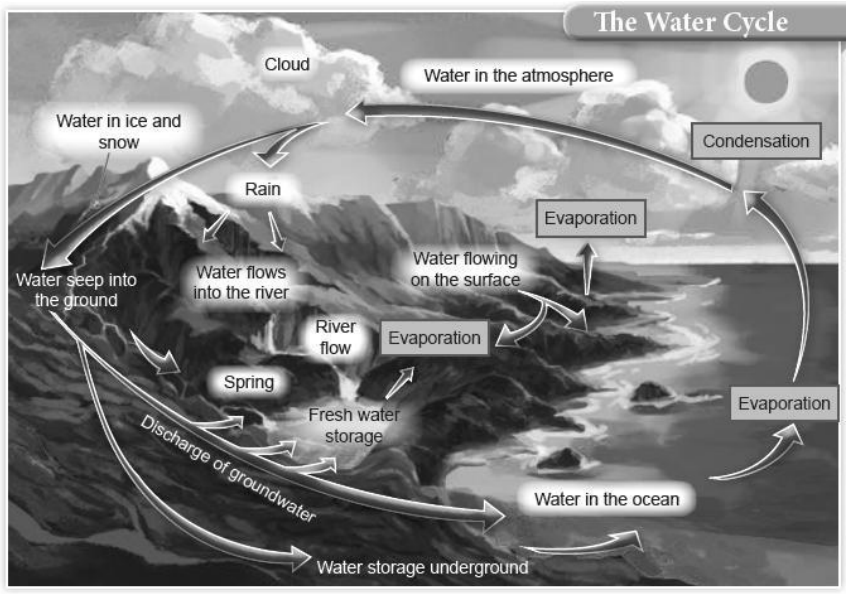
[2 marks]
[Understanding]

4. a) Match each organism with correct ocean stratification.

Organisms		**Ocean stratification**
i) 	●	Surface zone
ii) 	●	Midnight zone
	●	Dark zone

[2 marks]
[Remembering]

b) Diagram shows a water cycle.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statement	TRUE or FALSE
(i)	Evaporation occurs when water from oceans, rivers and land surfaces changes into water vapour due to heat from the Sun.	
(ii)	Condensation occurs when water vapour cools and forms clouds in the atmosphere.	
(iii)	Rainwater does not flow into rivers or seep into the ground.	

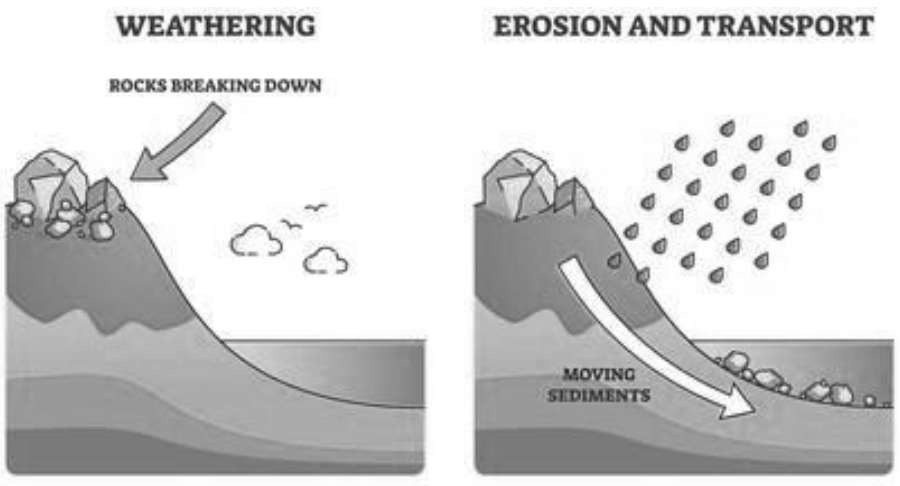
[2 marks]
[Understanding]

5. a) Match the following endogenic and exogenic process with its example.

Process	Example
(i) Endogenic process	Weathering
	Magma activity
(ii) Exogenic process	Tsunami

[2 marks]
[Remembering]

b) Diagram shows the Earth processes that cause changes on Earth's surface.



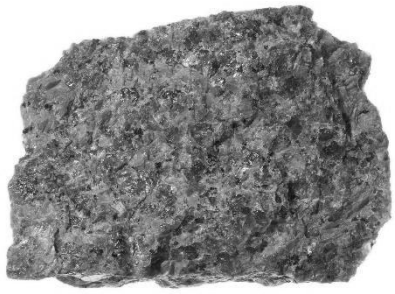
Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statement	TRUE or FALSE
(i)	Weathering is the process where rocks are broken down into smaller pieces at the Earth's surface.	
(ii)	Erosion and transport involve the movement of weathered materials by agents such as rainwater.	
(iii)	Weathering causes sediments to be transported from one place to another.	

[2 marks]
[Understanding]

Section C (9 marks)

1. Diagram shows an igneous rock.



a) State the formation of an igneous rock.

_____

[1 mark]

b) Give one example of an igneous rock.

_____

[1 mark]

c) Fill in the blank about the formation of:

(i) Sedimentary rock: Formed from the..... of sediment substances that carried by the river, glacier and wind.

(ii) Metamorphic rock: Formed when igneous rock or sediment rock exposed to a very ……... pressure and temperature.

high	low	compression

[2 marks]

d) Ani found a rock besides a river. State the type of rock and its characteristic.

Type of rock: _____

Characteristic: _____

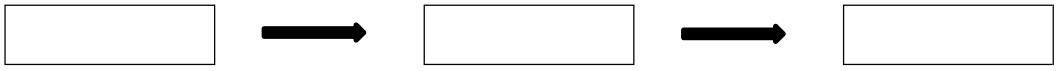
_____

[2 marks]

e) Arrange the flow of how the three main rocks are connected through the rock cycle model.

High heat and pressure change rocks into metamorphic rocks without melting.	1
Magma cools to form igneous rocks	2
Weathering breaks rocks into sediments that form sedimentary rocks	3

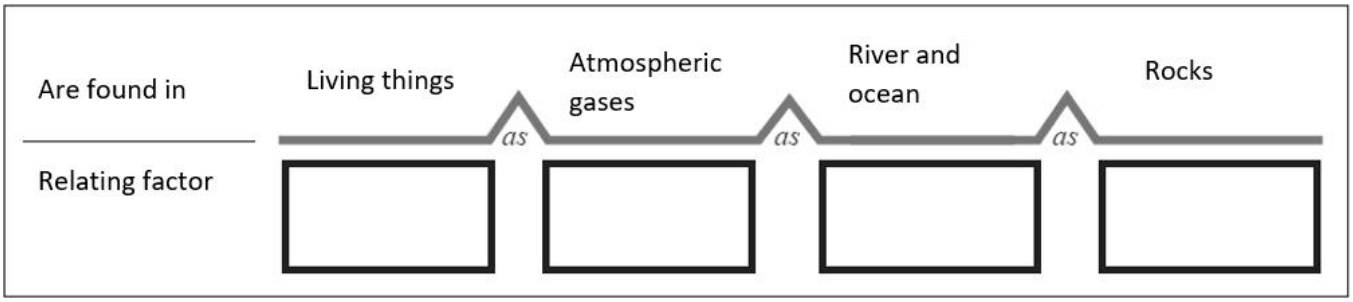
Arrange the process correctly.



[3 marks]

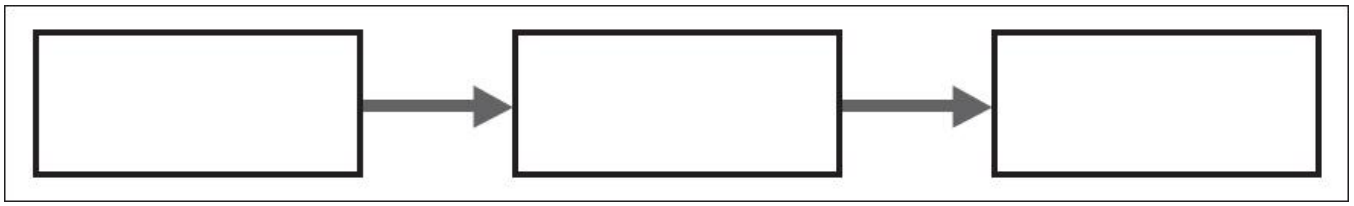
A4: Assessment (13 marks)

1. Complete the bridge map on the layer of the Earth.



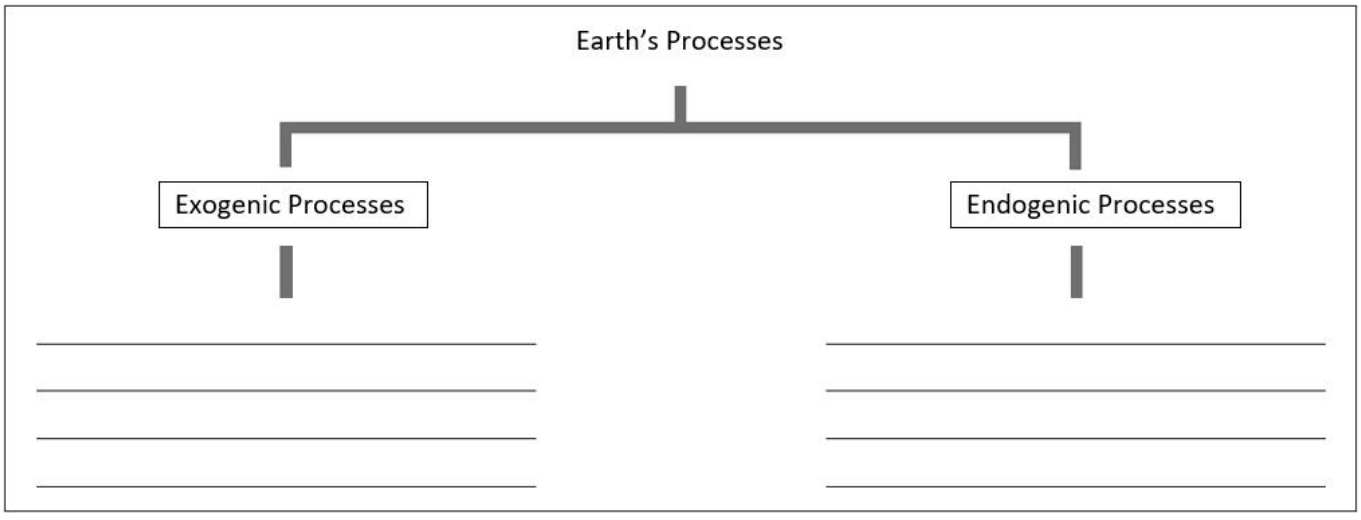
[4 marks]
[Remembering]

2. Complete the flow map to show the sequence of the zones in the oceans starting with the one which is the deepest in the oceans.



[3 marks]
[Remembering]

3. Complete the tree map below by stating three exogenic processes and three endogenic processes.



[6 marks]
[Understanding]

Session 18	
Learning Area	9.0 Earth
Content Standard	9.4 Geohazard phenomena 9.5 Age of the Earth 9.6 Earth resources an applied geology
Learning Objective	Students will be able to communicate about geohazard, justify the method to determine the age of the Earth, and solve problems about negative effect of unplanned human activities.
Learning Focus	1. Geohazard phenomenon and fossils. 2. Age of the Earth 3. Ways to solve problems of negative effect of unplanned human activities.
Teaching Aids	1. Smart Learning Notes. (Refer to A1) 2. UASA-format items Enhancement Exercises (Refer to A2) • Fact/knowledge (content) • Science process skill 3. Assessment (Refer to A3) 4. Answer scheme (Refer to A4)

A1: ***Smart Learning Notes***



A2: UASA-format items Enhancement Exercise
Section A (5 marks)

1. Diagram shows a geohazard phenomenon.



What is this geohazard phenomenon? [Remembering]

A Sinkhole
B Quicksand
C Earthquake
D Volcanic eruption

2. What is the device used to detect earthquakes? [Understanding]

A Tsunameter
B Seismometer
C Acid rain collector
D Light Detection and Ragging (LIDAR)

3. Which of the following is the importance of fossils? [Understanding]

A To increase soil fertility
B To prevent natural disasters
C To produce fossil fuels directly
D To determine the age of rocks and Earth

4. Which of the following is the unplanned human activity that can cause harm to all living things on Earth? [Understanding]

A Planting more trees
B Recycling waste
C Using solar energy
D Throwing rubbish into rivers

5. What is the negative effect of unplanned human activities on living things? [Understanding]

A Increase in clean air
B More rainfall occurs
C Animals lose their habitats
D Soil becomes more fertile

Section B (20 marks)

1. a) Identify the following occurrence of geohazards.

Earthquake	Sinkhole	Tsunami



i.



ii.

[2 marks]
[Remembering]

b) Diagram shows a tsunami.



Mark (√) for the correct statement.

Statements	Mark (√)
i) Seismometer gives early warnings of tsunami via satellite.	
ii) Tsunami can cause loss of habitat all living things.	
iii) Tsunami is one of the endogenic processes on Earth.	

[2 marks]
[Understanding]

2. a) Diagram shows two geohazard phenomena.
Name the geohazard phenomena.

Volcano eruption	Sinkhole	Earthquake

	
(a)	(b)

[2 marks]
[Remembering]

b) Diagram shows geohazard occurs in a city.



Mark (√) for the impact of geohazard phenomenon.

Statements	**Mark (√)**
i) Tsunami and earthquake can cause loss of life.	
ii) Geohazards only occur in cities and do not affect rural areas	
iii) Geohazards such as earthquakes and landslides can destroy homes and disrupt communities.	

[2 marks]
[Understanding]

3. a) Underline the correct answers for the following statements.

i) Fossils provide information about the (evolution / taste) of living organisms over time.

ii) Fossils help scientists identify the (types / sounds) of organisms that existed in the past.

[2 marks]
[Remembering]

b) Diagram shows a discovery of fossil.



Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

Statements	**TRUE** or **FALSE**
i) Fossil records can provide information about species that gone extinct.	
ii) Fossil evidence helps scientists determine the colour in which extinct organisms lived.	
iii) Fossils show the structure of organisms that lived millions of years ago.	

[2 marks]
[Understanding]

4. a) Diagram shows two human activities.



Deforestation



Open burning

Match each human activity with its negative effects.

Human activities	**Negative effect**
(i) Deforestation	Extinction of flora and fauna
(ii) Open burning	Global warming
	Depletion of ozone layer

[2 marks]
[Remembering]

b) Diagram shows a human activity.

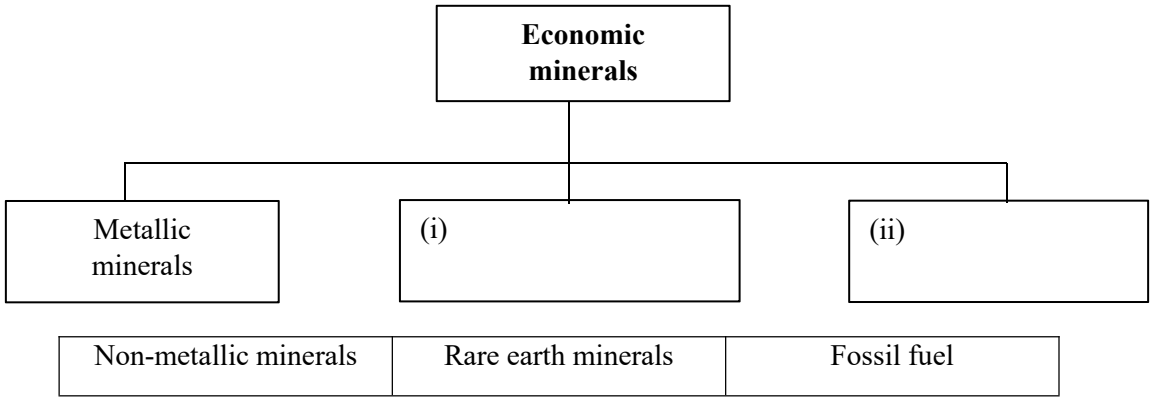


Write **TRUE** for the correct statements and **FALSE** for the incorrect statements.

	Statements	**TRUE** or **FALSE**
i)	The use of heavy machinery shows that deforestation is taking place in the forest area.	
ii)	Deforestation can cause the loss of natural habitats and reduce biodiversity.	
iii)	Deforestation increases the number of wild animals living in the forest.	

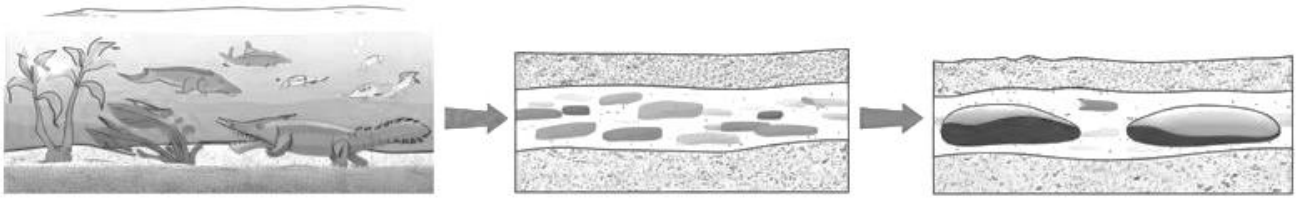
[2 marks]
[Understanding]

5. a) Complete the tree map below about the types of economic minerals.



[2 marks]
[Remembering]

b) Diagram shows the formation of petroleum and natural gas.



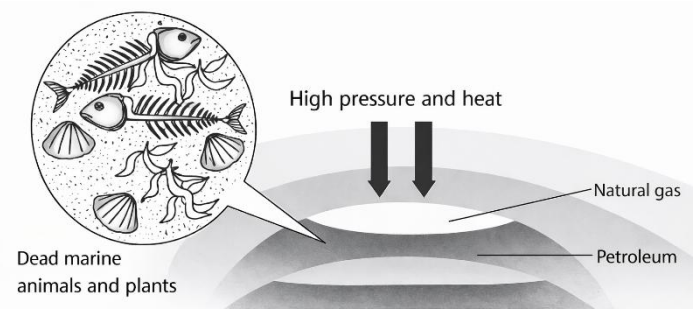
Mark (√) for the correct statements.

	Statements	Mark (√)
i)	The remains of sea plants and animals were buried under layers of sediment.	
ii)	Crude oil and natural gas are formed within a few years after the organisms die.	
iii)	Heat and pressure over millions of years changed the remains into fossil fuels.	

[2 marks]
[Understanding]

Section C (10 marks)

1 (a) Diagram shows the formation of petroleum and natural gas.



i) Fill in the blanks on the formation of petroleum and natural gas.

Dead-sea ……... settled on the seabed. ..... pressure

and ..... acted and changed them into petroleum and natural gas.

temperature	high	animals and plants

[3 marks]
[Understanding]

ii) Fossil fuel sources are limited and their supply will run out in the future. Generate ideas on how to use fossil fuels sources efficiently.

Idea 1: _____

Idea 2: _____

[2 marks]
[Applying]

(b) Diagram shows a tsunami phenomenon.



Underline the correct answer for justification on the effects of tsunami on the environment.

A huge tsunami causes serious destruction when it reaches land. It can result in (loss of life and damage to infrastructure/ weather changes).

[1 mark]
[Understanding]

(c) Suggest two safety measures that can reduce the impact of a tsunami.

1: _____

2: _____

[2 marks]
[Understanding]

(d) Justify how coastal areas more vulnerable to tsunami disasters.

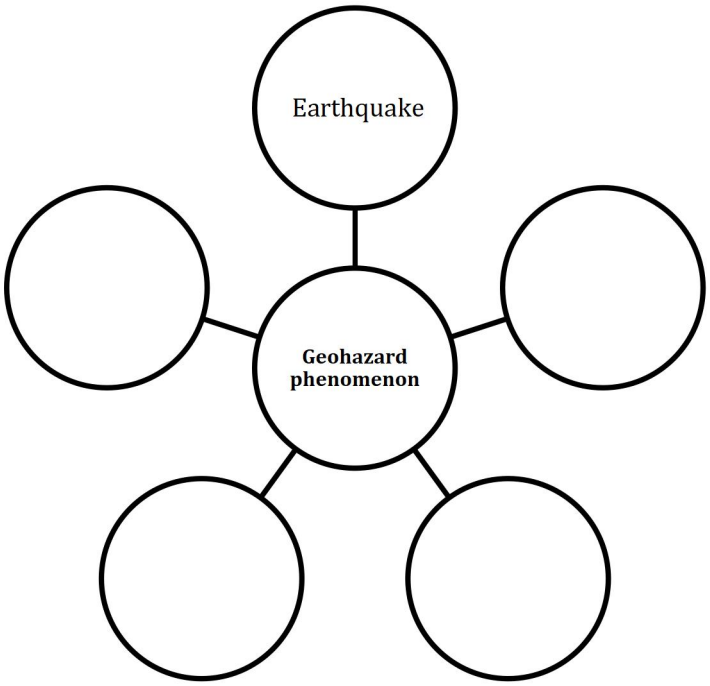
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_____

[2 marks]
[Understanding]

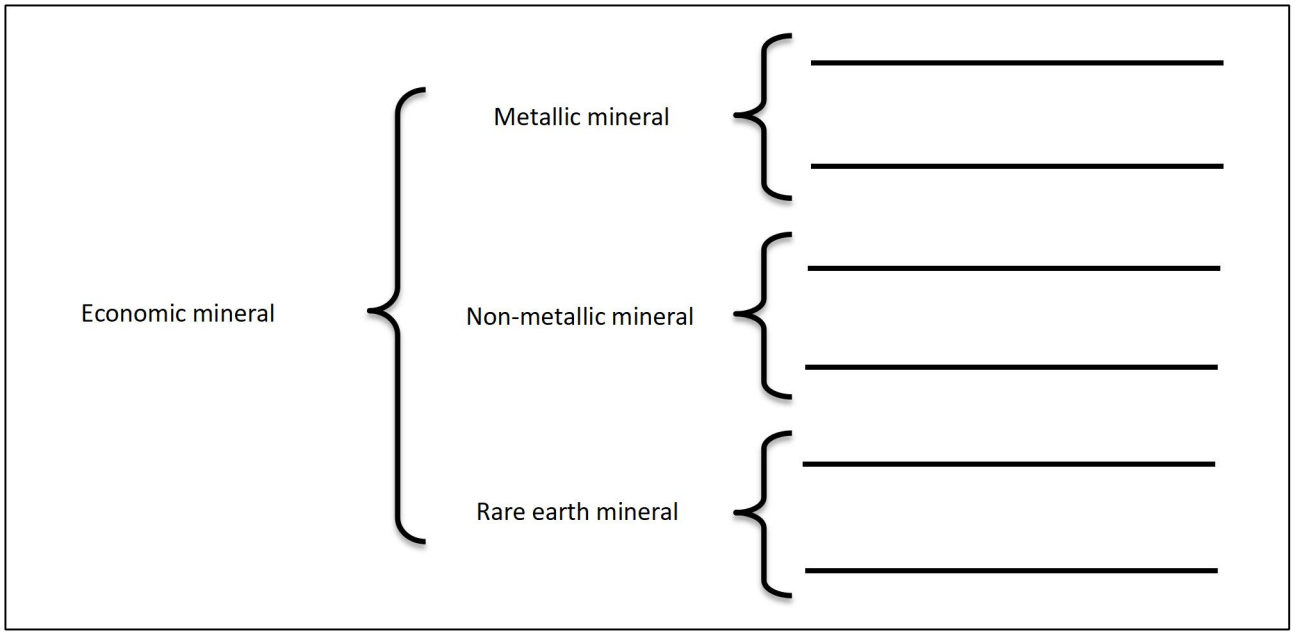
A3: Assessment (10 marks)

1. Complete the bubble map on geohazard phenomena.



[4 marks]
[Remembering]

2. State 2 examples for each type of economic minerals in the brace below.



Gold	Yttrium	Silver	Galena
Carbon	Limestone	Platinum	
Scandium	Marble	Sulphur	

[6 marks]
[Remembering]